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ISSN 0267-8277



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A gentle rain rolled through the office. Kai noticed that his program around him were sitting in a peculiar manner. They sat upon hollow and, if stored into, took the character as horizontal. He started to rise and shift around in his seat, and the others started towards him. As they approached, their feet legs drew back to reveal striking game field, small, sharp needles where their teeth had once been. What was this?

Oh just another day in the Year Commodore office.

We advise all major users, and authors, to use some computer magazines this by breaking ourselves this month, but none will last. Nightmares.

This new *Clive Barker* game has been delayed until April 1990 (and to lose the computer game from *Clive*), but that doesn't stop you from going to what it is to come - thanks to Steve Jones of *Spinal Tap* and, of course, *Clive Barker* himself.

But this is not the only issue named in your FUN FILLED SENSATIONAL BOMBAYAY PC. We also have our public programming writing, a feature on Role-Playing Games (with an extended *Wizard of the Shadow* preview), a *LifeStyle 2000* report, and all this in 13 pages of games reviews, as well as all your favorite regulars, surely we are the only complete Commodore magazine on the market!

I must dash you but I'll be in the PC show on 27th September in Glasgow, drop by and say hi!

Kai Henderson

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Quick on the draw

DONMARE, the company renowned for its license of *Tetris* Paradox, the computer game, has done it again. The license grabbing team at Donmarr heads a team we are to launch the computer version of the hit game *Proteus*.

If you haven't come across *Proteus* where on Earth have you been living? It bears a certain resemblance to *Cherubs*, but you are expected to draw the word for your team members rather than act it.

Micro Illusions - on their own

US based *Micro Illusions* is set to go on their own in the UK following a recent split from its UK distributor *Activision*.

After a couple of months uncertainty as to just who

Donmarr claims that a lot of "innovative graphics packages" that allows the drawer to produce lots of varying thicknesses, tables, rectangles, circles, etc., with ease.

Proteus, the computer game, allows teams to either draw the words for their team members, or, if they don't feel up to it the computer can draw the words.

Proteus should be out in September for the C64, PC and Amiga. Contact Donmarr on 01-758 1232 for more information.

was going to publish which product, *Micro Illusions* has announced that all its products will be distributed in the UK by itself. Watch out for new titles with the *Micro Illusions* label as the year flows.

Micro Illusions can be contacted on (0440) 49487.

Budget Blast-em

DONCASTER based *Blue Ribbon* is set to get your trigger finger working with its latest 2.99 C64 release - *Syntax*.

Armed with the latest concrete relay speaking on about you having to handle the latest angular drive lighter you can't go far wrong.

If you're the sort of person who prefers mauling that challenges your brain cells rather than your trigger finger then *Blue Ribbon* may be right up your street. Also present in 2.99 the game features questions on Sport, Entertainment and Geography.

Blue Ribbon can be contacted on (0425) 321134.



Below: The Third man we're working.

Below: Syntax surely isn't strict.



It's a joystick - honest!

WHEN the picture of Spectravideo's latest joystick laid out of the envelope it was greeted with cries of "What on Earth's that?" With a styling that looks as though it would be more at home in the bridge of the new Starling Enterprise than the living room floor the Q5-118 Wizardmaster appears to offer everything that the professional gamer requires.

The Q5-118 features 3 different control mechanisms, push button finger and thumb control or two different speed levers, 2 fire buttons, auto fire and a computer system select switch.

Three versions of the Wizardmaster are available, the Q5-118F priced at £1195 is the one that works with the C64 and Amiga Commodore Spectravideo on (0293) 515405 for details.

Super Wonderboy is Dynamite

SOME game titles have obviously had hours spent on deciding on a title. Activision can't be blamed for the existing title of Super Wonderboy, one of its latest co-op conversions. Super Wonderboy is the second of Activision's wonderboy arcade licenses. The hero of the original game, launched way back in 1983, had now grown up and is called upon to defend the people of wonderland from a fire-breathing dragon.

Super Wonderboy features 11 levels, 30 different weapons, winged boots, various types of arrows, different shields - everything a pony hero could want.

Activision's second co-op release a Dynamic Duo, Activision claims that we are in for a treat with the latest game around featuring cartoon style graphics, six levels, two bonus levels with extra bonuses on the 16 bit version.

Watch out for these releases in September Commodore Activision on (0734) 511686 for more info.

New show for Capital

A NEW computer show is set for launch in London in November. The Computer Shopper Show will take place at Alexandra Palace from November 24 to 26. Well known companies already plotting to appear at the show include: Pro-

gram, Portronics, Triton and Dynafit. Commodore UK will be taking a major role with the "Worldwide World Of Commodore" described by the organisers as a "major contribution to its own right rather than the Computer Shopper Show".

So if you're after your Christmas shopping get to Lily Pads in November.

PREVIEW



Name: Mystery of the Mayan - Release: 4.10



Name: Mystical - The Legend of Mystery - Release: 7



Name: Faded Angel - Release: 7



Name: The Christmas Game - Release: 7



More from the
Amiga
By Burghard
Lehmann

AMIGA WORKBENCH

When thinking about what to write in this column, it just crossed my mind that I haven't so far touched the more astounding things the Amiga can do, like its amazing graphics and sound capabilities. Maybe people would like in a column like this to hear more about how to get into programming these. (By the way, as I said in the first of this column, let me know about your interests and opinions!)

On the Amiga you have basically two ways of accessing the more powerful features of the machine. The first involves programming the hardware directly. If you set a machine code programmer, this is less difficult than you might think.

The second way, and the much better one to start with, is by making use of the many facilities the operating system offers you. That is, by using the library functions of the Amiga.

The libraries give you access to nearly all the advanced features of the Amiga, especially when it comes to graphics. You get most of what you want from the graphics library which includes some 77 functions. These allow you to draw lines, fill in spaces, animate objects and much more.

The graphics library also includes some text printing routines.

On the Amiga text is treated just like any other graphics. The advantage of this is that text and graphics can be intermixed freely.

If you program in Basic, most of the advanced facilities of the Amiga are available to you in terms of Basic commands. Amiga Basic from Microsoft is quite good in this way, once you get to know it. The only appalling thing about it is the editor. In my book the Amiga Basic editor ranks top in the list of the worst programs ever written.

But the word is, that Microsoft is developing a new version of their Basic which will be bundled with Workbench 1.4, expected to get onto the market sometime next year.

Anything has to be an improvement on the appalling present editor. I only hope that Microsoft will indeed spend some considerable time on improving the editor and not concentrate all their time on developing fancy new Basic commands and then do the editor again on the cheap!

Amiga Basic also allows you to use the Amiga libraries. This is one of its strongest features even though I would advise you to consider changing to C or assembler if you want to use the libraries extensively and do serious programming.

the world of
Amiga
David-Henry
Mann

AMIGA WORKBENCH

This brings me to my pet-peeve, which is C.

C is supposed to be the language of the Amiga. Most of the examples given in the Amiga Reference Manuals, published by Addison-Wesley are given in C.

Unfortunately, C is expensive, and, considering the time it takes to compile and link a program in C, I can't see for the life of me what the supposed time advantage in program development over assembler is to be!

I program in assembler, using the Genesis assembler by HiSoft. Most programs I can execute almost immediately after I have written them and inspect the results of my efforts. Even if I break a large program down into modules and have to link them, I can look at the fruits of my labour far sooner than with C!

At this point a spot of advice to assembler programmers. Even if you have an assembler that can use the *change include files*, don't use them! It takes far too long for the assembler to assemble all the include files which are loaded from disk. Sometimes your source needs only one or two variables out of hundreds in a complete include file.

Instead, type the library offsets and other system-specific source needs at the beginning of the source file as yourself! This is initially a bit more work, but once you have done this, you can use most of it over and over again by just changing them into any new source file you are writing - that is, if your assembler has got a merging facility, which it surely has, if it allows you to use include files. This additional work pays off handsomely in having your source files assembled in next to no time.

If you program in C, you have no other choice but to use the include files. This is why compiling a C program can be such a long drawn-out process.

At this point some of you might inquire, what are *switch include files* for?

Include files are simply lists of system variables compiled by Commodore in order to make life supposedly easier for C and assembler programmers. On other machines you have to generate these offsets and variables yourself from books and manuals. The include files, which come with every C-compiler and with most assemblers, make it unnecessary for you to type these things in yourself. And, as I've said, C-compilers depend upon include files.

There are two types of include files: The *h-include files* for C-compilers and the *i-include files* for assemblers. All include files are categorized by the Amiga libraries. E.g. there is an include file for the Exec library, one for the Intuition library and so on.

If you want to have a look at an include file, simply use the "type" command from CLI or load the include file into Ed, the CLI editor, or any wordprocessor.

Amiga Base also requires include files if you want to use libraries and devices from it. Unfortunately, Amiga Base can't do with either the *h-include files* nor the *i-include files*. It needs special include files, called "baseps". There is a program on the Extra disk which converts any include file into a baseps-file which can be used by Amiga Base.

Finally, programming the Amiga hardware directly is, as I said, easier than you might think. What you do have simply is you write certain values into certain fixed locations. These are the registers of the special chips of the Amiga. This is very similar to programming, let's say, the *808* neural chip on the *Commodore 64*.

Most of the information you'll need for that you'll find in the *Amiga Developer's Reference Manual* published by Addison-Wesley. For people who are into machine code programming, this is the nearest to digest of the four massive reference manuals.

Then better, especially if you want lots of example programs in assembler, is the *Amiga System Programmer's Guide* published by Abacus. And then, I have to tell you, there will very soon be a book on this subject on the market, written by yours truly and published by *Dobry Press* in England.

If you ever want to attempt to program the Amiga hardware directly, you have to be aware that the Amiga is a multitasking machine. Therefore, you can't program the Amiga as if you've got the whole machine to yourself! Whenever necessary your program needs you have to allocate using the functions provided by Exec. If you program the hardware directly, very often it is a good idea to brashly attempt multitasking by using the Exec *Forbid* library function.

Always remember to switch multitasking on again with the *Resume* function and, when you are done, to free the memory you have allocated for your program! Otherwise it isn't fair to other programs!



Above: The Probe Y-1000 concept

FUTURE SHO

Rik Henderson visits
The Daily Express Life-
styles 2000, and is thrust
forward in time to sam-
ple a taste of the future.

Photography by Frane
Maroeric

Although *Lifestyles 2000* was hyped as just about every form of media I really did not know what sort of show to expect. I knew that there would be many companies jostling to grab the punters' attention, but how much were they going to express the idea of life in the year 2000? Not much was the answer I came up with. But does that stop me from copying myself not bloody likely.

There were many stands, the majority of which being larger than an average one bedroom flat, although whoever came up with the idea of placing Sky TV next to BS2 had better thank a little for the next show – and a next show there will undoubtedly be.

We (my photographer pal, Frane, and myself) wandered into Olympia with our knees knocking (well, gently prodding the doorbell) with anticipation, when our eyes popped out and our tongues rolled to the floor for there in front of us was the bar.

Over our pointers had been christened with the beer of the year 2000, we sat about to sip with some world shattering confusion. Our first stop was the rather splendid Ford stand, with its eye of the future the Probe V. A very sleek car indeed and one to be sure of. It has actually been heralded as more aerodynamically efficient than a super-sound F15 military jet (fighter 14 swap it for my Raleigh Winner anyone).

We then strolled off to the Network Southeast carboatic of a stand after we'd looked out of the masses that the Probe V had plied us in – which was a lot better made than our. It presented an accurate representation of what computers – myself included – will be travelling on in the early centuries. It was very nice too, with digital displays presenting time, destination, and current stop (this is the first time, second, as well as individual light switches for each passenger). The only problem I have with this is that the first four three items will be installed on will be the Chalfonts line. For those who don't know, Wembley Stadium is on the Chalfonts line. I wonder how long the TV screens planned for delivery in late 1990 will last?

On our way to meet Ben and Laura (who we passed the *Katber* stand, and on a hot day, such as it was, the prospect of a free drink was a pleasant one to say the least. "But it's got no alcohol in it!" exclaimed Frane, oh what a shame we had).

The BS2 stand was far more extravagant than the one accommodating SKY, but then a had to be because of BS2's failure to release a satellite dish that works. They were even giving away, like badges of yourself, digitised on a normal video camera. Naturally I went back a second time, there's nothing better than having something (or two) to remember the show with, even if they make you look a complete idiot. But again, I do not see how the links into the theme of the year 2000.

The most impressive stand of all must go to *Tennessee World*, their stand was so large that they had constructed a complete studio in the centre. Around the studio were lots of small exhibits, including inventions and gadgetry that had been displayed on the show at one point. An honourable mention must go to the light drama, that provided hours of endless laughter (or at least a few nervous) watching people trying to hit objects that they could not see. Prastan? Not on your nelly not for drama anyone. We watched an episode of *TW* being made with the public controlling all aspects of the production, one could hardly tell the difference between this and the real version.

The ultimate part of the show for me was the fashion show. To read you into the mood of actually looking at the clothes and not the pretty girls parading them, the episode had a theme. "In the year 2000, the social layer has been dissolved, the girls have a lot to offer" was the occasion, but honestly

OCK

YOUR COMMODORE



Adam Bishop
Henderson in a
rather peculiar
aircraft.

Eleven

Walter of that's a
model. I would've
liked cycling it
together



*"I don't really see
how a pair of cycling
shorts and a rather
flimsy top will stop
you being fried to a
crisp."*



I don't really see how a pair of cycling shorts and a rather flimsy top will stop you being fried to a crisp. Oh well, the girls were great.

They seem of being dying in the boiler suits that they had to wear for part of it, the whole exhibition was taking hot, and Franc and myself welcomed every chance we could get to have a rest. Fortunately we had plenty of chairs, and therefore experienced a wonderful time.

Maybe Lubliner 1999 wasn't quite the right title for such an exhibition - I would have liked to have seen a little more futuristic equipment, as preferences to a badly eye back - but for all our enjoyment you cannot fault it. Franc had a good time too, and even walked away with a radio cap as a prize (photographers nowadays, pah).

Also missing was an adequate look at the eternal environmental issues - far more important for the year 2000 than nuclear television - although Friends of the Earth were there, just not in force.

GETTING OVER PHOBIA

Rik Henderson not so
much grills Tony
Crowther, but bases him
slowly on gas mark 4.
Well marinated of
course.

On Monday 17th July I was based in the back of the new Cookhouse with the sole intention of interviewing a certain Tony Crowther. Not to be surprised - after I was let out of the sack of course - Sheffield had to meet to offer than unexpected.

To say Tony is depressed in his profession would be an understatement. His life revolves around programming and now that he seems to be flavour of the month at Mirrorsoft, his future is looking very bright indeed. However, his past hasn't exactly been a failure. If you was to list all of his published games, that would take up pages alone, but everyone would recognise at least one of them - *Wacky Wale* the obvious. Having recently finished all the development of *Flakids* (RSP) in San Jose and a YC SURESHOT, he is to embark on an overnight project which is to last eight to nine months.

The new game is currently carrying the working title of Federation War, although Tony mentions that this is very likely to change. It is unlike any other Crowther game in the respect that it has a Role Playing theme - although set in the world of *Battle Tale*, *Alternative Reality* etc. - and it will be fairly similar to *quester*.

INTERVIEW ■

Raised very loosely on the planet of Star Wars, you play the part of an evil commander (not unlike Darth Vader) and you must steal a planet from rebels who do not wish to comply with the Federation. Once this task has been completed you can turn to your superiors and try to take over the Federation base (not unlike the Death Star).

All this is done using a rather new graphical style. The map on which the action takes place is seen in a top-down view, although everything is heard in 3D. Columns of walls and other landscape features (such as a wonderfully red cut-out of the darkness below) towards the screen, and you can zoom down to see the Star. All the graphics are very well drawn, which is not surprising as Tony is at least an artist, and he has recently programmed himself an easy-to-use Amiga Sprite Designer.

PERSONALITY PROFILE

Name: Tony And Crowder

Age: About 24

Favourite Computer: Amiga

Favourite Software Company: Microsoft (usually)

Favourite Film: *Robocop*, *Pink Flamingo*, *The Wall*, *The Last Days of Pompeii*, *Any Schwarzenegger movie*

Favourite TV Show: *LA Law*

Favourite Book: *0400 Manual*, *Wart*, *Any Book*

Favourite Food: *Las Vegas Cooking* (seriously)

Favourite Record: Anything by *Frank Sinatra*

Favourite Sport: *Cricket*, *Baseball* on TV

Favourite Paper: *The Trader* because it comes free through the post

Favourite Magazine: *Any with good reviews of Commodore games*

Worst Computer: *Spectrum*

Worst Computer Game: *Any game that isn't off on exciting and*

Worst TV Show: Neighbours

Likes: *Programming*

Dislikes: *Las Vegas and musical Cragg games. Not being able to draw*

Other Hobbies: *Painting (Art)*



"All the graphics are very well drawn, which is not surprising as Tony is at heart an artist..."

YOUR COMMODORE

Desert Islands Disks

I asked Tony what if he could have a computer — he requested an Amiga and a 200W power supply which coincided on a desert island, but was only allowed to take along ten pieces of software, what would he take? Here's his list.

An Answerer

"You would eventually be paid for any other software it would program my code, but I don't like using other people's utilities, anyway."

Dungeon Master

"I was so impressed a DM that when I found the legend, and couldn't get past him I phoned PTL in Australia and asked them for help. Since then I've completed *Chess Soldiers Back* — working for Microsoft does have its advantages."

Nobles

"A very good game, possibly covered by the fact that I received a free copy."

Shadowgate

"Although this was my least favourite of the *Shadowgate* series, I deserve a mention because I completed it on a day. David Bishop and I *chess* tested over the phone, proving the old adage: "Two heads are better than one."

Shanghai

"I often play this with Les (the wife). It is one of the few cards she enjoys."

Emerald Mines 1 + 2

"I'll count them as one game, because I've got them both on one disk. I can't remember if they are called *Emerald Mines* or not, but I think they're better than *Goldendash*, although almost there."

Rebound

"Okay so it's my own game. I still play it often, it stands me off all the hours I spent designing the screens. A lot of thought went into the laser gun."

Glenn Slalom

"A silly little game, but fun non-the-less."

Surpass

"A rock game and very enjoyable. It's a shame though, my disk has gone corrupt."

Any Inferno Adventures

"I have completed *Dark Day*, but the *Inferno* adventures are really my favourite games of all time. I prefer games that require a lot of thought."

And so we departed the Crowther household and visited my favourite part of Sheffield: The Pub. *Chess* enthusiasts may also go to the Crowther or only there after the interview. The Crowther game lives in a basement hall and *Spide* lives Crowther.

■ PC CORNER

Dear PC Corner,

I am writing to profess my thanks for the recent inclusion in your magazine of the Commodore PC's feature, and to enquire as to whether you may possibly be able to assist me with a few queries I have.

I recently decided to pursue a course of studies with the Open University. Armed with my trusty C64 I set about enquiring about the O.U. Information Technology course. Unfortunately I found that my C64 was not suitable for the course as it is not IBM compatible. The O.U. stipulate that the machine used for the course should use MS-DOS and have a minimum 512K RAM.

I therefore began to check out my local vendors. I soon discovered that I could get hold of a Commodore PC1, which I did. Okay, so I now have a machine matching the O.U.'s criteria, albeit a very basic one. Some time in the future I would dearly like to haul it up. I went back to the vendor and asked my quarters of a blank-faced branch manager, and more than 2 weeks later I am still awaiting some form of written reply!

As I purchased a very basic PC, I am aware that I can increase memory on the motherboard up to 640K, however, with some commercially available software requiring upwards of 1Mlog, obviously 640K is insufficient, I would like to add more. I want to enquire, with the present configuration of my machine, is it possible to add a hard card, and if so, how would I go about it? In the future of time, and as funds become available I would also like to add other facilities such as a modem card and a fax card. Again I was met with a blank stare and "Give me your name and address, I'll contact our technical people and come back to you". Some two weeks later, I again visited the shop "No answers yet", and the same blank stare. Then I asked if I could upgrade the CGA card from the PC1 and replace it with an EGA card, or even a VGA card. I'm currently awaiting an answer from their "Technical People" on that too!

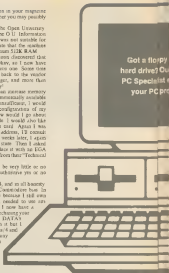
As the PC1 is an IBM clone, I assumed that there'd be very little in no problem with what I want to do, but I would like an authoritative yes or no before I commit any precious finances.

I bought your Commodore while I was using my C64, and as all beauty have been recently looking for a PC magazine with a Commodore bias. In fact I purchased the August 88 edition of the magazine because I still own my C64, and I wanted to study the listings to see if I needed to use any of them, when I scumbled across your PC feature. As I now have a PC1 and a C64, I now have twice the reason to continue purchasing your publication. When I purchased the PC1 I got Compaq DATA-ABLE II software and GW Basic that was loaded with it but I am curious as to whether or not, as with the C64, the Plus/4 and the C128, you provide listings in the magazine, are there any plans to include a similar listing for the PC's either in GW Basic or in any of the other languages available with these machines?

Althair Ian McCub, Thornaby-on-Tees

Dear Althair,

The problem of trying to get information about a computer from a sales man in an old old store. You don't say exactly where you purchased your PC1 but I'm hoping that it was from a more serious high street dealer. In my opinion the after sales help/service provided by many larger shops is simply atrocious once they've got your money they simply want to give you your new new



Got a floppy
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package and watch you disappear into the distance. I have found that you can get much better help if you purchase computers, peripherals, etc. if you go to a local computer dealer. OK so they may not be able to offer you all of those wonderful deals that you get on the high street but they are far more likely to be willing to offer you advice in the long term.

That's enough of me going on, now for your queries. A hard card can be fitted to your PC. Address or Southampton products now that is available. Address can be contacted on (0783) 422222.

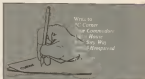
Any PC standard modem and fax card can be plugged into the expansion box as necessary.

Now for the video cards, replacing the CGA card enables doubling the onboard video by switching on switch 4 as detailed in the user manual, page 175. Your new video card will need to be placed in the expansion box also.

Unfortunately, you may have three available as it's your decision which board you choose to use.

Your Commodore has graded itself as the quality of its letters for many years. As Commodore venture into new computers it is the suspension's intention to move with them. Thus let us do intend to produce PC programming features and listings. However, while we have a large number of C64, Plus, 4 and C128 programs arriving on our desktop, our days we have never had any for the PC. So come on out there if you are into the PC and would like to write program listings or have produced a program that you think will be of interest to other readers of Your Commodore, get in touch!

PC Corner is designed to be your forum in the World of Commodore PCs. If you have any opinions that you would like to share, questions that you would like to see answered, or simply ideas for articles then do write to us. Without your help we can't make this column work.



Due to the process of getting a magazine out each month we can only answer queries through this column and cannot answer them on an individual basis.

PC CORNER

WOT NO

**Intergalactic layabout
Alex Bardy explores the
enormous world of Role
Playing Games.**

Explain the basic principles of a role-playing game (RPG) to the average "man in the street" and you are likely to be varied: some are plain-minded ("It's boardgame without a board"), while others find it quite fascinating ("The best thing since sliced bread and some monopolies"). Frankly, to be fair, RPGs have been around for well nigh 17 years now and probably as useful for more of people had only recognized it in times long passed, originally considered a direct descendant of the wargame, these past two or three years have seen the role-playing game become something of an arbiter among certain "factions". "The Hobby" has grown immensely in popularity in recent years, concrete results with the comic and computer games industries actually — and the key to all this growth? Quite simply, creativity and leisure. And neither are these two factors more or less vital (or indeed, more important) than in a role playing game.

The very idea of taking on the role of somebody else (much like an actor or actress in an award-winning *oojamaflop*) opens up a world of possibilities for the individual, but where that role can be anything from an alien to a superhero, a cowboy to a 19th century explorer, or a human to a fantastic creature of myth, that world of possibilities becomes all the more exciting, and these are usually three or four of you all playing such varied roles — what's what makes an RPG the little bit extra special.

Given a competent Gamemaster (GM) — the person who "runs" the game — a role-playing session can literally last for hours and hours (all for ones or twos!). The major difference between your everyday comic or computer adventure game and a role-playing session lies in the flexibility of the game — even the largest computer running the largest adventure game has a finite number of branches and by-ways. Not so with a role-playing game, which can (theoretically) run forever, while still continuously varying the "limits" of an RPG are classically defined as "the GM's imagination and leisure time" and that's about as accurate as you can get without doing a wobble over the philosophical/metaphysical possibilities, etc.

Some of the more popular RPGs currently available include:

DUNGEONS & DRAGONS (D&D)/ADVANCED DUNGEONS & DRAGONS (AD&D) — the grandfather of them all, D&D is still very popular even today not least because of the huge amount of support material available for the system. For those who don't know (and haven't guessed), D&D is a fantasy-oriented game with elves, faeries, orcs, and yes, dragons too — all making up a colourful and idiosyncratic backdrop for adventure.

TRAVELLER/MEGATRAVELLER — another 'oldie' although this time the backdrop is a huge universe of galaxy-hopping travellers, laser rifles, giant spaceships, and loads of technological marvels abound in this game, and support material (sourcebooks, scenarios, etc.) is extensive to say the least.

CALL OF CTHULHU (CoC) — the first of the new breed of RPGs, CoC is an RPG first and so tends to a particular genre as to a particular world (or more accurately to the "worlds" of a particular author). The gentleman in question is one Howard Phillips Lovecraft, a prolific author of early 20th



Above: Book him
Daddy!

"The very idea of taking on the role of somebody else (much like an actor or actress in an award-winning oojamaflop) opens up a world of possibilities..."

BOARD



Alas, I never even knew you, actually!

strategy, but stirred hell of some of the nastiest beasts you could ever wish to meet, and he linked together two mythical worlds of such creators (The Dungeons Tales and The Cthulhu Mythos respectively.)

The Call of Cthulhu RPG was originally based on Lovecraft's Mythos tales, but the game system has since been expanded to cover nearly all his works. Support material, once again, a gemstone. (Recommended)

TWILIGHT: 2000 and EMMAD — two RPGs (locally) set around our own Mother Earth, the former is one of the very few post-apocalyptic RPGs currently available, while the latter is set in surprise, surprise, the year 2000 a time when several powers (locally French, American, and Chinese) have achieved space travel, and colonized planets around the galaxy. Both these games are well supported, and as an ardent fan of EMMAD, the latter scores highly recommended.

MARVEL SUPERHEROES and DC HEROES — both of these games (created by Marvel and DC Comics respectively) allow prospective players the chance to don fancy dress, drink, and all-important night, and to go around blowing tall buildings and leveling blocks with single blows, etc. Great fun for all, and support material isn't thin on the ground for either game.

JOHUNE — a truly different RPG this, it's a sort of science-fantasy game set in a world where magic and science become one and the same. The game has been around for quite some time, and has something of a following of its period, it seems to be becoming increasingly popular though.

Set in its own world, Johune has a world lot going for it: the complete 'back-story' of the world it's set in is just the first of many players. Unfortunately, there's very little support material for the game, and it looks set to stay something of a cult game rather than anything else.

BATTLETECH — this 'RPG' started life as a wargame and, after almost 3 years, has recently become extremely popular with the masses. The game revolves around huge metal-like beasts (much like those Transformers you see on the TV ads) blowing the hell out of each other across all kinds of terrain. Fun while it lasts, the game has been given tremendous support (indeed, over the last few years no other game has matched it for the sheer volume of material that's become available).

GURPS — GURPS (Generic Universal Role-Playing System) is an attempt to cash in on every genre of roleplaying. The game system has been designed in such a manner that you can use it for all settings, be they fantasy, SF, hardboiled, espionage, or whatever. It's an experiment that's proven very successful, and currently available are sourcebooks (with extra rules, etc.) for all types of RPG, and even particular authors — there are books specifically covering Andre Norton's WITCH WORLD thingy and Alan Dean Foster's books for example.

SPACE 1889 (1889) — one of the newest RPGs to be released, it covers a kind of pseudo-historical 19th century where a guy called Thomas Edison has discovered space travel, and people like H G Wells and Jules Verne are most certainly not crazy. Venus, Mars, and the Moon are also inhabited (by leechmen, martians, and vikings respectively). Oh, and lasers, the atom, fusion / fission, etc. haven't been discovered yet — if it all sounds a bit weird, that's because it is, but it's a marvel of game design, and plays extremely well to boot! And all the Victorian 'decor' does nothing but enhance the game's overall effect on the players. Support material is limited at the moment, but things seem to be picking up in the domain now. 1889 is my personal fave of the bunch at the moment but I'm sure I'll get over it soon, probably.

HOUND OF THE SHADOW

Those familiar with the 'Call of Cthulhu' role-playing game will recognise the theme behind *Blasphemous Acts* latest computerised role-playing adventure. Having a distinct Cthulhu Mythos flavour, it is based in London in the up-roaring 1930s - and we can be assured that there is more than a tad of horror involved.

The first task to be performed, as in the RPG, is to create a character. This is done very impressively, using mixed graphics to the maximum effect. You can be male or female - this is your first choice - American or British, and you can choose from numerous professions. Not only are there characterists involved (you do not get to see them, only sentences on what sort of person you are) the skill system is marvellous.

There are many skills which you possess, but they are all set at an average level. Once you have determined how experienced your character is to be - 100 exp, etc. - you get to raise some skills a little, in order to be more adept at certain tasks.



Right: He can also being guided by the shadows



Left: What a this happy, well know me shows it's a job

The gameplay itself is rather like a text adventure, although graphics are well distributed throughout. The difference between the end, say an inferior adventure, is that *The Hound of the Shadow* is completely interactive. Depending on how proficient you are at certain skills, different text will come up at these sections. Every little feature that your character has, which makes him/her an individual, has an effect on the play, although it is possible to complete the game with any sort of character.

The game is not overcomplicated, say it is overly complex, but this is not a programming error, it is, in fact, a feature. The game is very simple to use indeed. This saves you the hassle of having to find the correct words to try with the computer in order to complete a simple logic problem.

Unlike most other adventures (which describes *The Hound of the Shadow* perfectly), this game does not rely on objects to build a complex clue pattern. Instead people use the order of the day, providing you to take more voice into it what goes on around you, and allows you to slip into your character's reality.

Every action undertaken says away time, which is important to the plot. The tension is a very important feature. This is to be strongly adhered to otherwise the *Hound* for it is after you or your friend, will rip you to shreds in typical H. P. Lovecraft tradition.

The graphics are very nicely painted in a two-tone style in a crumbly colour of beige/brown - much like those other photographs found in everybody's bag. The game text changes every time it is played with another character, and there are many, many small features added which make the game seem a little more personal to the particular character involved.

Although *The Hound of the Shadow* is not in the Bard's Tale mould, it is in every way as much an RPG, if not more so. The interaction level is superb and humour has it that if this is a success, more will follow with the ability to use your previous character(s).

Mike Henderson

A SHEEP IN WOLF'S CLOTHING

Win a sword, care of those wonderful people at Audiogenic, in our Lone Wolf competition. Maim your neighbour. Slice a friend...

You too can be as barbaric as Honor! Hampstead, as memorable as Rob Henderson, with a Lone Wolf-Playing sword made from fears (we don't want you hurting anybody now, do we? Do we?) This is the first prize in our Lone Wolf competition.

Also included as first prize are the two new Lone Wolf novels (regard of course!) Four second prize winners receive the two signed books.

What you have to do is study the photograph to the right and think of some speech bubbles for what you think may have been said - the other the better.

Write them on the back of a postcard, in sealed envelope, and send them to:

Silly Buggers Compo, Your Commodore, Argus House, Boundary Way, Honor! Hampstead, HP2 7SE.

Closing date: 31st September 1988.

The Rules

Entries will not be accepted from employees of Argus Specialist Publications, or Audiogenic. The restrictions also applies to employees families and agents of the companies.

The entry restrictions form part of the rules and the Editor's decision is final. No correspondence will be entered into. In the event of a postal strike, we reserve the right to extend the closing date.

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 BIG WOBBLY COMPO



BIG WOBBLY COMPO
 BIG WOBBLY COMPO
 BIG WOBBLY COMPO

A woman with dark, curly hair is shown from the chest up, looking back over her right shoulder. She is wearing a red top with a dark, patterned design. The background is dark and indistinct. The lighting is dramatic, highlighting her face and the texture of her clothing.

**BREEDING
NIGHTMARES**

Clive Barker's new film has a dark fantasy theme. Dave Hughes and Alex Blair talk to him on a very frantic, very elaborate, Pinewood set.

Photography by Murray Close

Clive Barker, although a prize-winning and highly-acclaimed horror writer, playwright, actor and general man-of-the-moment among horror fans, is without a doubt the film HELLRAISER for which he has caused himself most notoriety. A brilliant, stylish, complex collage of ideas, images, brutality, sexuality and death, HELLRAISER was Clive's directorial debut, a film made on a shoestring budget which has become the hottest movie of the Eighties, establishing its central bad-guy, the Cenobites, as the new Freddy Krueger, Michael Myers and Jason Voorhees. A sequel has already been released in the UK, although Clive himself mostly oversees the making of the movie, and there are plans for a third. Now Clive is working with a big budget, at a big studio, with big names and big ideas. As he told me on the set of the new picture, NIGHTBREED, "HELLRAISER was a little horror movie, that is a big fantasy movie. HELLRAISER was one house in Cryptoland, this is five sound stages at Pinewood Studios."

NIGHTBREED is based on one of Clive's own novels, CABAL. It follows the story of Boone, an innocent but mixed-up man convinced by his psychotic psychiatrist, Decker, that he is a multiple murderer. Fleeing the authorities, Boone discovers a lost city wherein reside all the rejected horrors of the earth and, having accidentally led his partners to the city, fights to save it from those who would destroy that which they don't understand. It is written by Clive Barker and stars THE FLY, VIDEOBOY and DEAD RINGERS director David Cronenberg and HILL STREET BLUES star Charles Hall. Clive says it is "much more than a horror movie", describing it as having "more heart, less cut meat" than his earlier films. A dark fantasy movie, then? "Absolutely," says Clive. "There is a large science element to it, and no more than what David Cronenberg can be entirely safe for science."

The set itself is a mixed bag - placed as it is between the features OUT sound stage and the top secret BATMAN set. Canadian police cars and trucks litter the exterior locations, which Clive delightfully points out the exact spot of waste ground where one of Decker's more hit-men craves a commuted (sorry, this is a family magazine) impressive enough is the unbearably high wall of the city, Malina, which has been breached by the Sheriff (Charles Hall) and his men in 1 act. Talk is of a major scene involving a crawling organism, which involves some testing special effects, and Clive's or is of escaped entities. Inside, elsewhere in the sprawling Buckinghamshire studios, the place is cluttered with every grotesque imaginable. NIGHTBREED is used to create over two hundred separate monsters, so's HELLRAISER special effects team (with Animation crew) make providing some astounding visuals and, working closely with Clive, ideas for the monsters themselves. I am asked if I am available to be another monster (they are rather short on actors or make-up...) in fact, Gigan Software's Gary Breyer has already been roped in to play one of them during his research for the forthcoming computer game. Has I decline and watch instead as Clive goes through the motions for another scene, before wrapping and spending the same time over lunch for a chat.

His attitude is very clearly different to this film: he knows his finances will be watched closely, and it is important that the film does good business both here and in the States. Boone has-offen successes in the fantasy genre (including INDIANA JONES AND THE LAST CRUSADE, BATMAN (see my article last issue) and GHOSTBUSTERS II) suggest that he hasn't too many worries. Two movies of sheer bloodlet were cut from HELLRAISER II, and Clive seems unconsciously aware that his movie-making must mature, or at least change. "I've never thought it was that important to advance," he says, "but it is important to change, to do something different all the time."

Emphasise this time around is very much on characterisation, particularly of the four lead roles. Boone, his girlfriend Lori, Decker and the Sheriff. "It is scary, but its major scenes come from genuinely caring about the people who are involved in this mission. I don't think the audience is gonna score out of this movie being detached about the characters, in the same way that they were detached from the HELLRAISER characters. HELLRAISER was a very cold picture: you couldn't really care for the characters." I ask him if working with David Cronenberg led Clive's own view of the movie, but he denies NIGHTBREED, he says is not Cronenberg's style. "He views it much more than anything in this picture, and although this is a dark picture in some respects, it is dark in a completely different way to the way he is dark. But it was wonderful to have him in the picture, partly because he is a hero of mine and partly because it was his first chance to do this. It's a massive role, and I think it comes across on the screen."





The latest news on the movie is that another six weeks' of filming is to begin at Pinewood, with Ralph McQuarrie (who designed much of the alien fauna of the STAR WARS movies) overseeing the ranks of the NIGHTBREED. Mass monsters are lined up, although a rumored three-hour rough-cut has yet to be edited down to a more manageable two hours' worth, and although scheduled for release at Christmas of this year, the UK release is now to be moved next Summer. In the meantime, Barker collects contracts for new material: THE GREAT AND SECRET SHOW (see first of The Art today) and look forward to the sequel to CABAL, which, Clive says, will probably be turned into the NIGHTBREED sequel HELLRAISER II (screenwriter Peter Atkins' script for HELLRAISER III has been accepted, and Clive is already looking at a screenplay for another of his stories, the one SON OF CELLULOID, which appeared in both THE BOOKS OF BLOOD and my own magazine, SKELETON CREW).

For Clive Barker, obviously, darkness is not an obstacle, but big business, the tapping of which is clearly his Art.

NIGHTBREED - THE GAME

Clive Barker's new film *Nightbreed* is to be produced by film screenwriter, Conan Seltman. This can only be judged as another brilliant marketing move by the company responsible for the *Blade* movie game (another superb horror deal).

This game will follow the plot of the film very closely (as contacts have told us of

which *Blade* is a world report, due to the fact that its Public Relations manager was asked to make his movie debut as one of the *Nightbreed*).

Apparently, Clive Barker himself had a reasonable input into the game design, thus making it very accurate on the detail side.

We have also been informed that it is to be more of an arcade game than anything

else.

As already explained in the main feature (what do you mean you haven't read it yet?), the plot of the film involves a creature named *Deena*, who has been wrongly judged to have murdered somebody. This is gone on for you.

Unfortunately for you too far, see the city of *Modern* - a land full of various races, the *Night-*

breed there he starts to change himself, take over of the said anatomy, and then it gets ugly.

Now that the movie has been made/shake. For an February release, the game has followed suit. It will be available on the *Amiga* and *CDi*, and you can bet that it'll be every bit as terrific as its cinematic counterpart.

Mike Heston.

"Ocean software's Gary Bracey has already been roped in to play one of them (the Nightbreed)..."



■ 128 CORNER

Dear 128 Corner,

Congratulations on the new 128 Corner. The article is a great idea, I hope it is a success. Here are a few hints and tips for you.

For a success message from your 128 owner: **SYSDIAGN, 123, 454, P00E4784, & P00E84785, 128** will increase the size of characters on 80 col screens (only not work on all versions of 128).

1281 partitions can be accessed from Postmaster 128 by sending the disk command / partition name.

When using Micro Ctr's 128, pop-up menus can be moved around the screen using the TAB key.

Graphics created as CALDPAR 128's second screen can be used with Postmaster by loading them into the converter as a two-screen picture.

I hope that there will be of some use to you.
P. Traynor, Warrington, Cheshire.

Dear 128 Corner,

I am looking forward to reading articles about the C128 in the new 128 Corner. The following questions may be of interest to other readers, in addition to myself.

What Vira Software is available for the C128 for Word Processing, Database and Spreadsheets?

What software does CP/M stand for. And what range of software can one use and is available?

Is it possible to switch from the C64 mode to the C128 mode and vice versa with a cartridge installed without damaging your computer?

I look forward to your reply in the pages of TC.
J. Beadley, Luton, Bedfordshire, England.

Two Vira products were launched for the C128. The first of these was Vira Classic, a very powerful wordprocessor and a favourite in the office. The second program is Vira Star. This program offers both database and spreadsheet facilities, while not as powerful as Vira Classic it is still a very powerful program. For Financial Systems Software if you are trying to track these down.

CP/M stands for Control Program for Microcomputers. Basically it was the first name for MS-DOS and the version of CP/M found on most IBM compatible CP/M allowed programs—seems to be run on a variety of computers.

There is a large amount of CP/M software available—mostly professionally written applications—information there is too much to list here.

If you want to investigate CP/M software further we suggest you take a look at the CP/M Kit and the CP/M Users Guide. Both of these are available from Financial Systems Software.

You could also try contacting the CP/M Users Group at 73 Mill Road, Bedford MK42 7RE.

Most cartridges are designed for the Commodore 64 computer and will not allow you to access the C128 while they are plugged in—they will store up the computer as C64. The only cartridge that we know works in C128 mode is the Warp Speed disk drive. It is a cartridge that is available from Financial Systems Software. Switching between C64 and C128 mode while a cartridge is plugged in, if the cartridge allows, should cause no problems.

Dear 128 Corner,

I like the C128 pages in TC. Could you mention in them that the 8128 version of Superscript World Style, formerly called Word Perfect, has now been modified to correctly underline when used with Epson's new 80-column printer, DPS1181. I asked the problem for them, and they sent me a very nice gift to return. Word Style works on either 40 or 80 columns. It has new Greek notes, features which text can be transferred. An easy to use, fully basic word processor, it's good value for £18. Anyone with C64 or Plus4 Word Perfect files can load them straight in to Word Style 128.
P. Simmonds, Skeltonthorpe, Nuffield

Thanks for your letter and the free plug for yourself. Hope that your comments will prove beneficial to some users out there.

Put pen to paper and tell us your news, views and groans

128 CORNER

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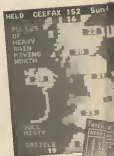
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Regular readers of *Your Commodore* will know that there's more to C64 computing than playing alone and solving adventures. In the next few pages we'll explore exactly what your C64 can do and what hardware and software is available to help you. First we'll look at the Soft Options of the programs you can run and then at the Hard Facts, which is the extra hardware you'll need to buy to get the most out of Commodore computing.

Soft Options

Word processing sits at the top most pole of company applications and the C64 has its fair share. These range from the cheap and cheerful to the exotic. Instead. At the top end of the scale *Word Weaver* is available through F S S.L., costs £79.95 but includes an 100,000 word spell-checker. A *Thesaurus* to ensure you always choose the right word and an outline utility to plan your writing through a series of sorted headings before you begin. The cheapest word processor is probably Logotron's *Writer 1285* that logically costs only £12.95 but includes a spell checker even though its operation is strange and slow. Before you buy a word processor think about what you're going to use it for: is it essential, more usage from letter writing to magazine articles (even books), and how one relates to your needs.

Other word processors worth considering are *Paper Script* and *PaperClip*. If you're thinking of producing multi-media, or reports including graphics and charts, then a GTP system will help considerably. For the C64 there are three main contenders: *GeoPublish*, *PaperClip Publisher* and *Step Press*. As with many packages each has its own strengths and weaknesses. *Step Press* from Database, is supplied complete with a three-button mouse and is controlled by mouse, but has a very limited selection of typestyles. *PaperClip Publisher* is very good but only supports the *PaperClip* word processor which reduces its value. Finally, *GeoPublish* is a little slow to use but, through a text grabber, you can incorporate text files from any word processor into your pages, and can also use any GDS fonts and graphics from programs such as *Print Shop* and *Newsroom*.



Above: And there is a heavy Depression in the West. He repeated. Right. Make sure you've got the right word with *Word Writer*.

Tony Heltherington gets serious as he looks into the business side of the C64

SERIOUS

GEOS - a disk operating system devised by California based Berkeley Software - has developed into a comprehensive system. *GeoPublish* is only part of a range that includes the *GeoWrite* word processor, *GeoFile* database, *GeoCalc* spreadsheet and *GeoChart* graphics utility. The whole system uses windows, icons, pull-down menus and a joystick or mouse controlled cursor.

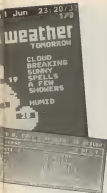
If you want to store and retrieve data then *Superbase* is still one of the best C64 databases. The *Programmer Software* package can read and sort your data, perform calculations based on it and store the answers. One function of a database is to provide a list of names and addresses that can be used with a mailmerge utility, supplied with most word processors, in order to send out a letter to everyone on your mailing list.

They say a picture is worth 1000 words and if you want to create multi-media using your C64 screen as a canvas then it is a wide range of packages to help you. Perhaps the best is the *DCA Art Studio* which was published by Rambrod. However, now Macintosh has brought Rambrod, DCP bought its package back and then sold it to Digital Electronics. Luckily the program isn't as complicated and it now represents excellent value for money. The new *Digital Art Studio* offer bundles the package with a 1351 mouse, mouse mat and mouse holder for only £29.99.

With the addition of a modem, your C64 can become a gateway into the world of bulletin boards and online services, such as CompuLink, that allow us to scan pages and pages of sample art, programs, and information at the press of a few keys and a BT phone socket.

Finally, you can add a television adapter to your C64 to view, store and read pages of information from *Crosas* and *Querc* services. These not only contain daily TV listings, weather and travel details, jokes and recipes but





also the latest news, sports results and stock market prices. This browser particularly useful if you're planning on using programs such as picnic predictions, as a utility is supplied to read the server buffer and will allow you to use the information in your own programs.

Hard Facts

Disk drives

Unless you're a phobic file purveyor, or you actually enjoy long loading times, you'll need to invest in a third drive. There are a number on the market, including Commodore's own. One of the best buys is Exabyte Micro Cosmo drive which is a standard drive, is fully compatible with Commodore's and comes free with GEOS. Expect to pay about £150 for a drive but look out for special offers.

Printers

A good printer is essential if you want to get the most out of applications such as word processing and desktop publishing. These range from low cost Epson, Star and Monospace Tally dot matrix printers to laser technology. The Star 4.0-89 C is particularly fun as it is not only a good blank and white work horse it can also print out full colour images created by art packages.

Graphics tablet

If you're really serious about C64 graphics and you've used and discarded journals and tapes in electronic pen-and-ink then why not invest in a graphics tablet. These are ideal for tracing in outlines of objects and pictures into a package and also make working with fine detail a lot easier. If you want the best there look out for the Koala Pad as it's supported by most art packages.

Video Adapter

Microcast produce a very reasonable video adapter that can either use a video recorder or raster (supplied extra) and plugs into the C64's vier port. It has a cable that connects to the video out socket of the video recorder and can even be in a different room.

SOFTWARE



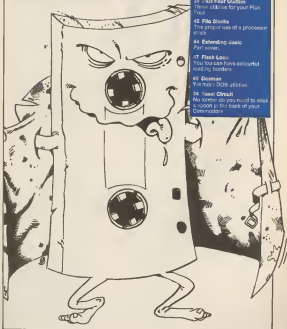
Mouse and left GEOS, a system for every use

"Stop Press, from Database, is supplied complete with a three button mouse..."





YOUR PROGRAMMER

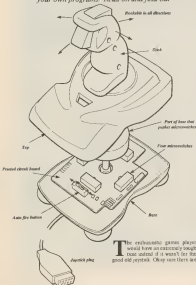


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No longer do you need to stick a spoon in the back of your Commodore

Give it some stick

Just how does a joystick work? How do you use it in your own programs? Read on and find out



The enthusiastic games player would have an extremely tough time instead of it weren't for the good old joystick. Okay, sure there are

games that do not require control from such a device, but, for the shoot-em-up game there is just no substitute. But how do they work?

We all know what a joystick looks like. Usually it will have a stick with a fire button or buttons, a base, a lead and maybe an axis-fire switch.

Inside the joystick beneath the stick there are four switches for up, down, left and right directions. The better joysticks use microswitches which make a definite click when you move the stick. The cheaper ones use a four pointed star made out of thin tensile steel. Moving the stick causes a point of the star to come into contact with a pad on the printed circuit board inside the joystick. The trouble with these is that after prolonged use the star begins to show signs of fatigue and eventually a point of the star will break off making it impossible to move in one of the directions.

If we take a look at the schematic in diagram 1 of our typical joystick, we can see how the components are electrically connected to make up such a device.

As you can see there are seven connections to the joystick plug. Three are up, down, right, left, fire, ground and +5 volts dc.

Each ground switch will be activated by moving the stick in one of four directions. You can also trigger two switches by moving the stick diagonally, for example in a northwest direction.

Now the next part of the program will be trying to determine the status of these four switches and hence the position into which you have pushed the stick, but you can't just plug the joystick in any old where. It needs to be plugged into special interfacing hardware via a joystick port.

Most computers have a joystick port appearing as some convenient position on its case. Some require a joystick interface that plugs into the computer's edge connector which has the processor's data and address bus running to it. The interface will do the decoding necessary to convert the movement of the joystick into the data signals that the program will need in order to work out what position the joystick is in. If the joystick port is built in to the computer, then it will have such an interface already made in.

The resultant or circuitry inside the computer will look something like

diagram 3. We have the address decoding chip and a data bus buffer. The address decoder is needed to read the status of the switches on the joystick at specific times. That is, when a specific unique address exists on the address bus and at no other time. If we did not do this, then we would have all sorts of erroneous data on the data bus, which would cause the computer to lock up.

When the unique address comes along, it will force the decoder to create an enable signal to the data buffer. This buffer will then put the status of the joystick switches onto the data bus of the computer circuitry ready for the program to read and act upon.

Let us imagine that you have moved the stick to the up position. This will cause the signal on the up line to go low (to ground). When the data buffer is enabled this will cause the output on D0 to go low, or in other words to be set to zero. The data bus would then have a binary value of 1111110 (decimal 154). The program would look at this value and know that the up position has been selected. Similarly if we push the stick to the right then we would have a binary value of 1111010. If we select a western position, the means that over/under up and right will be active which will put a binary value of 1111010 on the data bus. Likewise pressing the fire button will cause D4 to go low thus obtaining 1110111. Get the idea?

The program will then, at very frequent intervals possibly during an interrupt routine, be working out the status of all the joystick switches and taking the appropriate action upon its data bus findings.

As mentioned earlier, some joysticks have an analog fire switch. This brings us to play a simple or elaborate game which reacts to continuous areas of pulses at about 10 per second (each pulse mimicking the fire button). This is basically a luxury for those people



playing a game that requires a lot of firing, thus saving your fingers from having to press the fire button all the time. The multibooter uses the +5Vdc line for its power.

Well that's about all there is on

As you are aware, the Commodore family of computers each have two controller ports, numbered one and two. Normally, these controller ports are used for reading the joystick or mouse when playing games. With a little imagination on your part, you can use these ports for gaming input from the user, instead of the normal keyboard method.

Each joystick has five switches, one for the fire button and four for direction. These switches correspond to the lower 4 bits of data held in the joystick location. By pecking these locations, we can decide what action to take, depending on the values returned. Always remember a value of 0 signifies that either a direction was NOT chosen, or the fire button was NOT pressed.

The table shows the values returned for each direction. A value of more than 128 indicates that the fire button was pressed at the same time.

Reading the ports is a simple job, and on the Plus 4 and C128 is a made even easier by the use of the JOY command. C64 users however, have to do a little more work. (Don't they always?)

Below you will see two BASIC listings for determining the state of the joystick. I have purposely kept the listings on a very simple level. The point of this text is not to show you programming skills or techniques, it is simply to show you how to read joystick information.

The first listing can be used by both Plus 4 and C128 users. The second is for C64 users.

joysticks. Once you've seen one you've basically seen them all except that some are designed better for prolonged use and comfort and some are designed better for fast action. It really is a personal choice, so try before you buy.

```

1000  REM *****
1010  REM *****
1020  REM *****
1030  REM *****
1040  REM *****
1050  REM *****
1060  REM *****
1070  REM *****
1080  REM *****
1090  REM *****
1100  REM *****
1110  REM *****
1120  REM *****
1130  REM *****
1140  REM *****
1150  REM *****
1160  REM *****
1170  REM *****
1180  REM *****
1190  REM *****
1200  REM *****
1210  REM *****
1220  REM *****
1230  REM *****
1240  REM *****
1250  REM *****
1260  REM *****
1270  REM *****
1280  REM *****
1290  REM *****
1300  REM *****
1310  REM *****
1320  REM *****
1330  REM *****
1340  REM *****
1350  REM *****
1360  REM *****
1370  REM *****
1380  REM *****
1390  REM *****
1400  REM *****
1410  REM *****
1420  REM *****
1430  REM *****
1440  REM *****
1450  REM *****
1460  REM *****
1470  REM *****
1480  REM *****
1490  REM *****
1500  REM *****
1510  REM *****
1520  REM *****
1530  REM *****
1540  REM *****
1550  REM *****
1560  REM *****
1570  REM *****
1580  REM *****
1590  REM *****
1600  REM *****
1610  REM *****
1620  REM *****
1630  REM *****
1640  REM *****
1650  REM *****
1660  REM *****
1670  REM *****
1680  REM *****
1690  REM *****
1700  REM *****
1710  REM *****
1720  REM *****
1730  REM *****
1740  REM *****
1750  REM *****
1760  REM *****
1770  REM *****
1780  REM *****
1790  REM *****
1800  REM *****
1810  REM *****
1820  REM *****
1830  REM *****
1840  REM *****
1850  REM *****
1860  REM *****
1870  REM *****
1880  REM *****
1890  REM *****
1900  REM *****
1910  REM *****
1920  REM *****
1930  REM *****
1940  REM *****
1950  REM *****
1960  REM *****
1970  REM *****
1980  REM *****
1990  REM *****
2000  REM *****

```

Fire Button	DIR
Value	Description
0	None
1-128	Up
129-256	Down
257-384	Left
385-512	Right
513-640	None
641-768	Up
769-896	Down
897-1024	Left
1025-1152	Right
1153-1280	None
1281-1408	Up
1409-1536	Down
1537-1664	Left
1665-1792	Right
1793-1920	None
1921-2048	Up
2049-2176	Down
2177-2304	Left
2305-2432	Right
2433-2560	None

This is the final part of our series for turning your C128 into an expert system

By Paul Schofield

Over the last two months, we have been providing you with the means for turning your C128 into a mass expert system. The first two sections dealt with the knowledge base and language generator.

INQUIRE is the last of the three programs making up our expert system shell. *Knowledge-based Systems and Shell Technology* (McGraw-Hill) contains the program needed to interrogate the knowledge base and evaluate the user responses. The operation is fairly self-explanatory, but some knowledge of the programs operation is useful for debugging and tuning your application.

On starting the program you are first required to identify the knowledge base to be used. Once this has been done the target texts, condition texts, solution rules and application rules are loaded into a set of arrays. The reader writes in the solution rules array, which defines the operations to be performed and includes the necessary references for accessing information from the other data structures.

Before questioning the user, the program first displays any data retrieved by the knowledge base giving background information on the items of the knowledge base (eg. it also displays background info on a page if the user has typed the user address when first or originally to be displayed).

After this a standard help that will answering questions is displayed. The user condition. It is possible to generate a user address screen.

It is possible to generate the solution rules array starting with the entry for target 1. It assigns each condition for the target and unless the condition is irrelevant for this rule, the user is asked to answer the condition question. The answer is used and evaluated to determine whether it is the required result for the target. If it is the program continues with this target otherwise it marks the condition abandoned and continues with the next target. There are two reasons why a target may be abandoned, either it is rejected, because a part of a condition has the wrong value or it is simply abandoned because of a don't know response. It is important to note that a don't know does not rule out a target, it is simply ignored during the first part, so there is room for a solution that does not rule out the result of the particular condition.

After each knowledge is entered a further check is performed to ensure any other conditions are implied by the result and the appropriate results are then available on. This means that as the inference engine proceeds through the sets of targets and conditions it finds it already has the answers to a considerable large number of conditions and so does not have to ask the user.

Hopefully, if Don't Know answers have not been given, a solution rule for a target will be satisfied. At this stage a solution is asked, which displays the possible solution and generates user file options to edit. From the possible or previous matching knowledge solutions. A further option (Why?) is provided.

Why?

The why option allows you to request a justification for the solution. What makes a track track through the targets and application conditions provided to date and explain the actions of text. This is extremely useful for debugging a knowledge base and is also useful to the end user who wishes to examine the reasoning used to reach the solution. Where the expert system is used for comparison and a new category has to be introduced then you give a useful clue to the new conditions required and which targets are affected.

No (More) Solutions

Alternatively a More response after a solution or a number of Don't Know responses can cause the inference engine to exhaust the list of targets. At this stage the user is informed that no or no more solutions could be found. The option to try again is given if any don't know answers were given. This causes a complete re-assessment of the data to be performed. This time the don't know response only affects the current rule, so that if the same unknown condition exists in several rules and no clear answer is given, it will be asked repeatedly. This means that the entry is very tedious and there is no point

is suggesting the order in which some don't know conditions are going to be answered.

Applications

Having already typed in three programs, it may seem a little odd to be talking about one in our expert system shell. For the basic user, however, expert system applications are far from obvious, so it is quite useful to consider a few areas of potential use and also some considerations for constructing a useful knowledge base.

One very obvious application for the home computer user is a program design aid, indeed I originally developed the *Scenarios* of the earlier program to assist in developing my *Robozone* Master program. Good software players will have written programs and no doubt have had a slight flare of the paglio courtesy with certain types of bugs. This is a crack at posing the question "what good strategies are there possible?" A more covered approach should have been to ask "what is the best strategy available and to play?" In most cases the answer is the same and once the algorithms were coded and problems solved, it would have required a major rewrite to correct a major shortcoming.

Formulating the strategy in RAL format is very simple, simple and possibly enlightens one's view.

General optimization applications are also easily handled, as are queries to procedures, such as an extended version of the classical analysis example of the convertible car maintenance. Some care is required in the lines of these uses in the order in which the targets and conditions can be quite critical to the usefulness of the system produced. The reason program can be quite helpful in solving some of these problems. In some specialized applications it could prove to be possible that both targets and conditions have to be expressed in terms of less strings. A typical example is a solution that is based up at a result of several rules being true. This tends to be a problem of many general purpose expert system shells, as what is really required is for a qualified rule compiler or action, which is not always in the general solution. This is, however, a disadvantage, if a simple unique solution is sought. Such applications can, however, be handled by planning for multiple solutions and testing each target solution found and always continuing to look for further solutions.

The final application area that should be mentioned is education. The queries and answer technique is quite a good way of illustrating to children how to approach various types of problem.

Figure 4 illustrates a simple knowledge base for identifying mathematics shapes. This also demonstrates how to use queries to reduce the number of queries asked and also shows how multiple solutions can be stored. In this case finding the additional solutions will demonstrate that a square is also a rhombus, a rectangle and a parallelogram.

Is our expert system shell intelligent?

It is still a subject of great debate as to what constitutes Artificial Intelligence. Some would argue that all programs are intelligent, while others would claim that to qualify, a program must mimic human intelligence. It is primarily the function of an expert system shell to provide a sensible strategy for evaluating the rules of the user's system. It's the presentation of the rules by the user that will determine how intelligently the particular system will respond. With *INQUIRE* I have deliberately left as much control as possible to be convenient for the applications in which I use it. This means that the order in which both targets and conditions are defined is critical to the performance of the finished system. In most applications, however, it is only the order in which the targets are examined, that is of any concern to the user and it would be preferable if the conditions were examined in the most efficient order. In other words the inference engine includes the intelligence to decide the best order to evaluate the conditions. One such strategy can easily be incorporated within *INQUIRE*.

After displaying the help texts and a subroutine which scans the relations

array $p(i)$ by condition number and compare counts of the number of targets affected by each condition. These counts are then sorted to produce an array $pr(i)$, such that $pr(i)$ is the number of the most need conditions and $pr(i+1)$ is the least need condition. The following changes are then needed in the main program:

```
1340 p=1: y=0
1350 do while p = len and y=0
1355 mp(1)=p
1360 p=p+1
```

The only slight complication with doing this is that in comparing the counts, empty conditions should also be taken into account. Otherwise it is possible that the revised evaluation strategy may prove less efficient than the original one, and that's not intelligent.

1000 0	1) THE SLOPE AND X SIDES	25 - 1 0 0
2) THE SLOPE AND Y SIDES	26 - 0 1 0	
3) BOTH SIDES AND YENY THAN X SIDES	27 - 0 0 1	
4) BOTH SIDES AND YENY THAN X SIDES	28 - 0 0 1	
5) BOTH SIDES AND Y SIDES	29 - 0 0 0	
6) BOTH SIDES AND Y SIDES	30 - 0 0 0	
7) THE SLOPE AND X SIDES	31 - 0 0	
8) THE SLOPE AND Y SIDES	32 - 0 0 0	
9) THE SLOPE AND Y SIDES	33 - 0 0 0	
10) THE SLOPE AND Y SIDES	34 - 0 0 0	
11) THE SLOPE AND Y SIDES	35 - 0 0 0	
12) ALL POINTS ARE EXACT ANGLES AND	36 - 0 0 0 0 0	
13) THE OPPOSITE SLOPE AND ALL PARALLEL	37 - 0 0 0 0	
14) THE SLOPE AND PARALLEL	38 - 0 0 0 0 0	
15) THE SLOPE AND PARALLEL	39 - 0 0 0 0 0	
16) THE SLOPE AND PARALLEL	40 - 0 0 0 0 0	
17) THE SLOPE AND PARALLEL	41 - 0 0 0 0 0	
18) THE SLOPE AND PARALLEL	42 - 0 0 0 0 0	
19) THE SLOPE AND PARALLEL	43 - 0 0 0 0 0	
20) THE SLOPE AND PARALLEL	44 - 0 0 0 0 0	
21) THE SLOPE AND PARALLEL	45 - 0 0 0 0 0	
22) THE SLOPE AND PARALLEL	46 - 0 0 0 0 0	
23) THE SLOPE AND PARALLEL	47 - 0 0 0 0 0	
24) THE SLOPE AND PARALLEL	48 - 0 0 0 0 0	
25) THE SLOPE AND PARALLEL	49 - 0 0 0 0 0	
26) THE SLOPE AND PARALLEL	50 - 0 0 0 0 0	
27) THE SLOPE AND PARALLEL	51 - 0 0 0 0 0	
28) THE SLOPE AND PARALLEL	52 - 0 0 0 0 0	
29) THE SLOPE AND PARALLEL	53 - 0 0 0 0 0	
30) THE SLOPE AND PARALLEL	54 - 0 0 0 0 0	
31) THE SLOPE AND PARALLEL	55 - 0 0 0 0 0	
32) THE SLOPE AND PARALLEL	56 - 0 0 0 0 0	
33) THE SLOPE AND PARALLEL	57 - 0 0 0 0 0	
34) THE SLOPE AND PARALLEL	58 - 0 0 0 0 0	
35) THE SLOPE AND PARALLEL	59 - 0 0 0 0 0	
36) THE SLOPE AND PARALLEL	60 - 0 0 0 0 0	
37) THE SLOPE AND PARALLEL	61 - 0 0 0 0 0	
38) THE SLOPE AND PARALLEL	62 - 0 0 0 0 0	
39) THE SLOPE AND PARALLEL	63 - 0 0 0 0 0	
40) THE SLOPE AND PARALLEL	64 - 0 0 0 0 0	
41) THE SLOPE AND PARALLEL	65 - 0 0 0 0 0	
42) THE SLOPE AND PARALLEL	66 - 0 0 0 0 0	
43) THE SLOPE AND PARALLEL	67 - 0 0 0 0 0	
44) THE SLOPE AND PARALLEL	68 - 0 0 0 0 0	
45) THE SLOPE AND PARALLEL	69 - 0 0 0 0 0	
46) THE SLOPE AND PARALLEL	70 - 0 0 0 0 0	
47) THE SLOPE AND PARALLEL	71 - 0 0 0 0 0	
48) THE SLOPE AND PARALLEL	72 - 0 0 0 0 0	
49) THE SLOPE AND PARALLEL	73 - 0 0 0 0 0	
50) THE SLOPE AND PARALLEL	74 - 0 0 0 0 0	
51) THE SLOPE AND PARALLEL	75 - 0 0 0 0 0	
52) THE SLOPE AND PARALLEL	76 - 0 0 0 0 0	
53) THE SLOPE AND PARALLEL	77 - 0 0 0 0 0	
54) THE SLOPE AND PARALLEL	78 - 0 0 0 0 0	
55) THE SLOPE AND PARALLEL	79 - 0 0 0 0 0	
56) THE SLOPE AND PARALLEL	80 - 0 0 0 0 0	
57) THE SLOPE AND PARALLEL	81 - 0 0 0 0 0	
58) THE SLOPE AND PARALLEL	82 - 0 0 0 0 0	
59) THE SLOPE AND PARALLEL	83 - 0 0 0 0 0	
60) THE SLOPE AND PARALLEL	84 - 0 0 0 0 0	
61) THE SLOPE AND PARALLEL	85 - 0 0 0 0 0	
62) THE SLOPE AND PARALLEL	86 - 0 0 0 0 0	
63) THE SLOPE AND PARALLEL	87 - 0 0 0 0 0	
64) THE SLOPE AND PARALLEL	88 - 0 0 0 0 0	
65) THE SLOPE AND PARALLEL	89 - 0 0 0 0 0	
66) THE SLOPE AND PARALLEL	90 - 0 0 0 0 0	
67) THE SLOPE AND PARALLEL	91 - 0 0 0 0 0	
68) THE SLOPE AND PARALLEL	92 - 0 0 0 0 0	
69) THE SLOPE AND PARALLEL	93 - 0 0 0 0 0	
70) THE SLOPE AND PARALLEL	94 - 0 0 0 0 0	
71) THE SLOPE AND PARALLEL	95 - 0 0 0 0 0	
72) THE SLOPE AND PARALLEL	96 - 0 0 0 0 0	
73) THE SLOPE AND PARALLEL	97 - 0 0 0 0 0	
74) THE SLOPE AND PARALLEL	98 - 0 0 0 0 0	
75) THE SLOPE AND PARALLEL	99 - 0 0 0 0 0	
76) THE SLOPE AND PARALLEL	100 - 0 0 0 0 0	

Plus/4 Utilities

We present three basic
but very useful utilities
for the Plus/4 and C16.

By D. Glass

One thing that every Plus/4 owner knows, is that we are constantly being ignored by software companies and magazines. Between them, these pillars of the computer industry, are trying to squeeze us out, just as they did with poor old VIC20 users. But, thanks to magazines like *Your Commodore*, we shall overcome. I have decided to present you with 3 simple, but nevertheless, useful routines for our favorite machine. The routines are: **Sqread**, **LIST** (list files) and **LIST** (driver).

Sqread

This handy little routine is particularly useful to those without **Script/Plus**. The routine will read sequential ASCII files made by **Script/Plus**, **Super Script**, **Superpage** and should read files from most word processors (including **J&F**, but with strange results). As it is written in **M C** it can handle the speed of a **1551** disk drive and will display 'pages' very quickly.

How It Works

We start at address **\$1000** so that the program can be run from **Basic**, after setting up the screen display by changing colors and using the **LINES** routine at **\$1120** to draw two lines across the top of the screen and by using the **MULTI-WRITE** sub routine at **\$1180** to write **LISTA**, the program now waits for the file name to be input. As the name is entered, it is stored in the tape buffer (**\$B000**) until a carriage return is entered. "S.R." is then added to the file name. The program will try to open the file and check the **STATUS WORD**. If no file is found then the program will jump to the no file routine at **\$1080** and carry through to the end routine at **\$1000**.

If the file is found, then the **NEXT** routine (**\$1060**) is used to output the file contents to the screen, as it does so it will check to see if screen line 20 is empty, if not then a jump to the **PAUSE** routine at **\$10C0** is made. This will flash the cursor word by looking for a space and pause the program until an option is selected. Flushing is done by using **INTAKE** and **LISTA** is output to the screen. Once a key is pressed the program will either jump to the end routine at **\$1080** or clear the screen, send **BACK** to the drive and return to the **NEXT** routine at **\$1060**, so continuing to read the file until the screen fills again or the file ends.

If end is selected the program can be re-run to read another file.

Instructions

Run the program from **Basic**. The program will then ask for the file you wish to read, type this in (you can use wild-cards and pattern matching). You need not add the usual sequential codes at the end of the file name as the program will do this for you. From return and the program will look for your file, if it does not exist then the program will inform you of this and finish, check the spelling of your file using the directory and then re-run the program. When the file is found then the contents will be displayed on the screen until the screen is nearly full, the program will then pause to allow you to finish reading the screen. Press "y" to continue or "q" to quit this file, if "y" is pressed then the screen is cleared and the program will carry on until the screen is full again or the file finishes.

Re-run the program to read another file.



Getting It In

Basic needs to be moved to \$2000 before loading the Basic loader
Type the following exactly as shown, check before pressing return

POKE 4432,POKE43,POKE41,NEW (RETURN)

This will raise BASIC, giving space for the M/C Load and run the Basic loader

If all is well then the program will say so. If it is, then enter the MONITOR and type the following -

5*SEQREAD'D,100,1075

Where D=8 for disk or 1 for tape
The new program SEQREAD will be saved

Reset the computer or if you have more than one of any machines then type **F 1000 10FF 00 (RETURN)** to clear the work space then type **R** to return to Basic, type **NEW (RETURN)** and you are ready to load the next BASIC loader

1551 Head Cleaner

This is an essential program for the 1551 user

When the drives head is too dirty to read a disk, cleaning usually requires keeping a cleaning disk spinning for about thirty seconds. This program (PCH) on tape (or otherwise means!) will spin your disk for you

How It Works

The program is in M/C to keep loading time to a minimum. We start at address 10001 so that the program can be run from Basic after setting up the screen display by changing colours and using the **LINES** routine (\$1005) to draw two lines across the top of the screen and by using the **MULTI-WRITE** sub-routine at 100C5 to write **LISA**. The routine at 10043-1004C will set the top of a screen window just under the two lines, the program now waits for the user to insert a cleaning disk and confirm that fact using the **beginner** routine at 10056

When ready the program will set up a count of seven and send an **INITIALIZE** command to the disk drive, rotating the drive and therefore spinning the disk, after rotating has occurred the program will decrement the on-screen counter, checking that "0" has not been reached, and send another **R** etc until "0" is reached. This takes about thirty seconds. A sub-routine will check to see if the letter **N** has been pressed, if so the program will branch to **NO (100F)** which will close the channels and return to Basic. If the count reaches 0 a about 1/3 rotation then the channels will be closed and the program stopped

Instructions

Run the program from Basic. The program will pause for you to insert a cleaning disk. Press "n" then you are ready and the count down will begin. If for any reason you need to stop the cleaning then press "n" and the program will stop, close the channels to the disk drive and return to Basic.

Type **RUN** to restart.

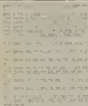
Getting It In

Basic needs to be moved to \$2000 before loading the basic loader
Type the following exactly as shown, check before pressing return

POKE 4432,POKE43,1,POKE40,NEW (RETURN)

This will raise Basic, giving space for the M/C Load and run the Basic loader

If all is well then the program will say so. If it is, then enter the MONITOR and type the following



5755H HEAD CL45N'DA100J1C9

Where D=0 for disk or 1 for tape.

The new program 151 HEAD CL45N will be used.

Reset the computer or if you have more than one of any machine then type **F 1000 0FFF 00 (RETURN)** to clear the current password then type **F 5** to return to Basic, type **NEW (RETURN)** and you are ready to load up your Basic loader.

1551 Device

Do you have more than one Disk Drive.

Many people do not like opening up their drives and setting switches on, so order to access the second drive.

A short quick ML program will do this for you. It was especially written for the 151.

How It Works

The start is at address 51001 so that the program can be run from Basic, after setting up the normal display, boot-loading routines, and using the "FINCH" routine (51006) to draw two lines across the top of the screen and by using the "M.L.D.R.W.I.T.C" sub routine (51010) to write "5151" the program then uses the keypress routine (51009) to wait for the device number to be typed and will compare the input to "0" and "1" it enables then to be processed. The routine will jump to one of two routines, 51011 (51011) or 51012 to to select the number before pressing, in "HEAD" (51008) to send the command to the drive, along the command channel before printing "5151" on the screen, telling you that the number has been changed.

Instructions

Run the program from Basic. The program will pause, and wait for the number of all of the drives that you do have to be entered.

Switch off and confirm this by pressing **ENTER** or **RETURN**.

The drive will now be changed and the program will returned to Basic.

Getting It In

Basic needs to be moved to 52000 before loading the Basic loader.

Type the following, which is shown above before pressing return.

POKE 44,5151:POKE 44,1:POKE 44,0:NEW (RETURN)

This will move Basic, giving space for the M.C. Load and run the Basic loader.

If all is well then the program will say so. If it is then enter the MATHFOR and type the following.

8715H DEVICE NUM'DA100J1C9

Where D=0 for disk or 1 for tape.

The new program 151 DEVICE NUM will be used.

Reset the computer or if you have more than one of any machine then type **F 1000 0FFF 00 (RETURN)** to clear the work space then type **F 5** to return to Basic, type **NEW (RETURN)** and you are ready to carry on writing.

Filo-Stacks

Get to grips with the First In Last Out format of the Stack

By Steven Burgess

A stack can be described more simply by using an analogy, if you have a tower of building blocks, a stack of building blocks you can only take blocks off the top and you can only put blocks on the top, if you try to take a block from the bottom of the pile (stack) then it will fall down, it is impossible to put a block on the bottom of that pile without first lifting it. The same rules apply to stacks in computers, data can only be put on the top of a stack and taken from the top. The acronym FILO describes this, a stack is First In Last Out. The first item to be put on is the last to be taken off, and the last item to be put on is the first to be taken off.

SP	↓	CONTENTS	LOCATION
			1
			2
			3
			4
			5
			6
			7
			8
			9
			10
			11
			12
			100
			101
			102
			103

STACK POINTER = 0

DIAGRAM 1.0

Stacks are used extensively in machine language programs and are also used by BASIC, whenever GOSUB is encountered, the return address is stored on a stack, so that the computer can return to the correct place when the RETURN statement appears. Stacks are also used during FOR NEXT loops. Machine language programmers use stacks to store the values of registers which may be corrupted by a routine which they wish to use.

Pushing!

The process of adding items to a stack is called pushing, you push a piece of data onto the stack. The actual programming of this is very simple. In order to push data onto a stack you must have a number of things:

1. A stack (you can use an array in BASIC)
2. A stack pointer

SP	↓	CONTENTS	LOCATION
		1001	1
			2
			3
			4
			5
			6
			7
			8
			100
			101
			102
			103
			104

STACK POINTER = 1

DIAGRAM 1.1

3. Data to push

When we enter the data which you want to push the stack pointer is increased by one, the data is then PUSHED onto the location indicated by the stack pointer and you have finished. The same process is repeated every time you push to a stack.

Let's pretend we have set up an array, in BASIC as a stack, then it currently has data stored therein. The stack pointer is pointing at location 0 (see diagram 1.0), let's enter a value 1021, we increase the stack pointer to 1 and store 1021 in location 1 (see diagram 1.1). Entering another value, 4038, causes the same process to occur, except the stack pointer now becomes 2 (see diagram 1.2).

Popping!

This removes an item from a stack - you pop it. Popping an item from the stack causes the stack pointer to go down 1, when the stack pointer is pointing at,

SP	↓	CONTENTS	LOCATION
		1001	1
		4038	2
			3
			4
			5
			6
			7
			8
			100
			101
			102
			103
			104

STACK POINTER = 2

DIAGRAM 1.2

```

PROGRAM STACK DEMO
00 10 CLEAR:
01 80 PRINT@R1:"1" TAB(40);:GOTO 10
02 80:GOTO 10
03 80 POP@R1 TO 20 PRINT @R1:
04 80:GOTO 10
05 80 POP@R1:
06 80 POP@R1:
07 80 POP@R1:
08 80 POP@R1:
09 80 POP@R1:
10 80 POP@R1:
11 80 POP@R1:
12 80 POP@R1:
13 80 POP@R1:
14 80 POP@R1:
15 80 POP@R1:
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193 80 POP@R1:
194 80 POP@R1:
195 80 POP@R1:
196 80 POP@R1:
197 80 POP@R1:
198 80 POP@R1:
199 80 POP@R1:
200 80 POP@R1:

```

the last item to be pushed, to be taken off the stack (popped) the stack pointer is then decreased, pointing at the item which was pushed before the previous one.

We shall now pop an item from the stack described above (see diag 1-2), to pop we simply read the item which is stored in the location indicated by the stack pointer. The stack pointer contains 2 as the item we pop is stored in location 2. The answer 4016, we then decrease the stack pointer by 1 so it becomes 1. Popping again gives us 1021 and empties the stack. The stack is empty when the stack pointer is 0. The stack is full when the stack pointer is equal to the number of elements defined in the array.

The program 'STACK DEMO' demonstrates popping & pushing to the full. Type in the program using the syntax checker. Save it to DISK, TAPE and type RUN (RETURN).

On execution you will be presented with a graphical representation of a stack on the left hand side of the screen, the stack has room for 20 elements, on the right hand side of the screen is a menu. The options are as follows:

- 1.POP
- 2.PUSH
- 3.END

On selecting option 1 you will be told what the value of the POPped item is, if the stack is empty you will be informed.

Selecting 2, you will be asked to

enter a value, numeric or string, the value will then be added to the stack and you will be returned to the menu. End is self explanatory.

Well I hope you can find some use

for stacks well, although, the program goes in not really useful it should demonstrate how stacks operate and the routines can be adapted for use in your own programs should you find the need.



When developing a large Basic program you'll find that sooner or later the line numbers become quite messy. In one part of your program you have codes of space between line numbers, while in other parts it's impossible to insert a single new line.

The only answer is to renumber the textfile.

This is what the tool kit routine does which we want to develop this month. Again, once you understand how Basic deals with lines and line numbers, this is quite straightforward to do. And here Commodore Basic makes, for once, life easier for us, by having structured a textfile in quite a special way.

The Linkpointer

Commodore starts each Basic line with a pointer to the next line. In this way a Basic textfile is chained. To find a specific line you don't have to sift through the whole of the textfile. Instead you just jump from line pointer to line pointer, each time looking at the actual line number which follows directly afterwards. The rest of the line you can ignore.

The linkpointer contains the address of the start of the next line, expressed in the usual low byte/high byte way.

The end of the entire line has been reached when the two linkpointer locations contain zero.

Renumbering a textfile involves simply jumping from linkpointer to linkpointer, each time changing the line number that follows on the next two locations.

Renumbering Options

But in order to make our renumbering routine as useful as possible it is a good idea to include some options into the command.

First, we want to be able to determine in what step the textfile will be renumbered. "Step" means the distance between each line number. For example, most programmers number a textfile in steps of ten.

Secondly, we want to be able to determine where in the textfile the renumbering starts and where it ends. This is useful if you have a large textfile where you have numbered (or noted down) with which line number certain important sections start. You may not want to upset the Basic layout, but you, as writer/reader, need some local renumbering to be done, in order to be able to insert some new lines.

For renumbering I have chosen the extended Basic command **RENUMBER**.

Renumbering is, of course, only done as a direct command. The command wouldn't make any sense as part of a program.

You can use the command without any parameters, in which case the whole of the textfile will be renumbered in steps of ten.

The first parameter is the step value.

After this comes a comma, and then the second parameter follows. This gives the start line of the renumbering process. You may omit this parameter too, in which case the whole of the textfile will be renumbered in the steps given in the first parameter.

After another comma follows the final parameter which gives the last line to be renumbered. (Actually, the way the routine works out, the last line to be renumbered is one line before the line given.) This last parameter can be omitted too, in which case the textfile will be renumbered from the starting line given to the end of the textfile.

The line number given at the start of the renumbering process will not be changed. The renumbering starts after that line. Also, the renumbering will stop one line before the line given at the end, as already mentioned.

How It Is Done

First, we gather the parameters after the **RENUMBER** command (lines 1990-2000). If there are no further parameters (or more at all), we will find the usual zero which terminates the line. **ENDQ**, therefore, tells us if no parameter or no further parameter is there.

Extend Basic

Renumbering your
textfile is easier than
you may think

By Burghard-Henry
Lehmann

```

1          REM *****
2          REM *****
3          REM *****
4          REM *****
5          REM *****
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7          REM *****
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nding asic

If a parameter is given we gather it into the appropriate variable by calling on two ROM routines, **SAVEA**, get the value itself and place it in the floating point accumulator. **SKIPT** gets the value from the floating point accumulator and puts it into zero page **\$14** (L), and also into the Y-register (low byte) and the accumulator (high byte).

After each parameter the next character is tested to see if it is a comma. If it isn't, the routine exits by giving a syntax error report. That syntax error report is forced simply by jumping to the normal routine (lines 1400-1500) instead of returning from the subroutine, since the whole of the renumbering routine is a subroutine.

In the case of no start parameter, we enter 10 into the variable, called **STEP** (lines 2150-2160). This will result in the textfile being renumbered in steps of ten.

In the case of no end parameter, we enter zero into the variable, called **START** (lines 2430-2440).

In the case of no step parameter, we enter the highest possible line number into the variable, called **END** (lines 2480-2500). That is, of course, 65536, or **FFF** in the low byte and **FFF** in the high byte.

Renumbering a Textfile

First, we get the beginning of the textfile from the system variables **\$18/\$C** and copy it into our variables, called **LINKPOINT** (lines 2630-2710). The beginning of the textfile means also the first linkpointer in the chain of all the linkpointers.

Next, we test if the start parameter had been given (lines 2750-2760). If a value's we jump straight to beginning of the renumbering routine proper. Otherwise we have to find the last where renumbering starts.

As I've said, with the help of the linkpointer, that's pretty easy.

We enter a loop which jumps from one linkpointer to the next (lines 2830-3050). That is, the address contained in the linkpointer is gathered and becomes the next linkpointer, and so on.

At the beginning a test is made, if the end of the textfile has been reached (lines 3050-3060). If the end of the textfile has been reached, that means, that the start has given does not exist. In that case the routine exits, with a syntax error.

Lines 3060-3070 perform the clearing action itself.

Before we enter the renumbering loop itself, we gather the line number after the linkpointer where we start into a variable, called **CURRENTLINE** (lines 3110-3160). This variable always contains the line number to which the step value is added, performing the renumbering itself.

At the beginning of the renumbering loop itself, we test first of all if the end of the textfile has been reached (lines 3230-3260). That is, if the low byte of the linkpointer contains not zero, the loop continues as normal. If it contains zero, the high byte of the linkpointer is tested for zero. If that too contains zero, the end of the textfile has been reached. The routine exits.

Next, the next linkpointer is put instead of the former one in the variable **LINKPOINT** (lines 3310-3360).

Then we test if the line given in the end parameter has been reached (lines 3400-3430).

For the I am using a special way of comparing two 16-bit values (lines 3460-3520).

As you know, on the 6510-40 using with 16-bit numbers can be quite involved. To compare two 16-bit numbers, we subtract the two numbers flag each other and place the result in a variable, called **TEMPSTORE**. This variable has no other purpose but to set the zero and carry flag.

If the first value equals the second, the zero flag will be set. If the first value is less than the second, carry will be clear. And if the first value is larger than the second, carry will be set.

In our routine, if carry is set, it means that the end parameter has been reached and the routine exits.

Finally, the renumbering itself is done by adding the step value to **CURRENTLINE** (lines 3550-3620) and then writing the new line number into its proper place (lines 3660-3710).

Address	Hex	ASCII
0000	00	
0001	00	
0002	00	
0003	00	
0004	00	
0005	00	
0006	00	
0007	00	
0008	00	
0009	00	
000A	00	
000B	00	
000C	00	
000D	00	
000E	00	
000F	00	
0010	00	
0011	00	
0012	00	
0013	00	
0014	00	
0015	00	
0016	00	
0017	00	
0018	00	
0019	00	
001A	00	
001B	00	
001C	00	
001D	00	
001E	00	
001F	00	
0020	00	
0021	00	
0022	00	
0023	00	
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0025	00	
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0027	00	
0028	00	
0029	00	
002A	00	
002B	00	
002C	00	
002D	00	
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0030	00	
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0036	00	
0037	00	
0038	00	
0039	00	
003A	00	
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003C	00	
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003F	00	
0040	00	
0041	00	
0042	00	
0043	00	
0044	00	
0045	00	
0046	00	
0047	00	
0048	00	
0049	00	
004A	00	
004B	00	
004C	00	
004D	00	
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0050	00	
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0090	00	
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009C	00	
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009E	00	
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00A6	00	
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00AA	00	
00AB	00	
00AC	00	
00AD	00	
00AE	00	
00AF	00	
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00BA	00	
00BB	00	
00BC	00	
00BD	00	
00BE	00	
00BF	00	
00C0	00	
00C1	00	
00C2	00	
00C3	00	
00C4	00	
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00C6	00	
00C7	00	
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00CA	00	
00CB	00	
00CC	00	
00CD	00	
00CE	00	
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00EC	00	
00ED	00	
00EE	00	
00EF	00	
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Flash Load

Create your own flashing bands whilst loading and saving your creations

By Clive Horner



Flash Load is a machine code program which creates the flashing bands while loading a normal program from cassette, just like commercial software.

To use the routine type in the Basic loader and save it. Once you are happy with it you may find it. You should now see the message **FLASH UNARMED**.

There are a couple of ways to control the program. For example in direct mode you can type

POKE1,0 This will reset the computer back to normal.

POKE1,1 This enables **FLASH LOAD**. This is necessary after a reset or after resetting the computer.

Also when saving programs the flashing bands will also appear.

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Flash Load
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  750 REMARKS *****
  760 REMARKS *****
  770 REMARKS *****
  780 REMARKS *****
  790 REMARKS *****
  800 REMARKS *****
  810 REMARKS *****
  820 REMARKS *****
  830 REMARKS *****
  840 REMARKS *****
  850 REMARKS *****
  860 REMARKS *****
  870 REMARKS *****
  880 REMARKS *****
  890 REMARKS *****
  900 REMARKS *****
  910 REMARKS *****
  920 REMARKS *****
  930 REMARKS *****
  940 REMARKS *****
  950 REMARKS *****
  960 REMARKS *****
  970 REMARKS *****
  980 REMARKS *****
  990 REMARKS *****
  1000 REMARKS *****
  
```

Get the most from your disk drive with this enhanced DOS utility

By M. Holmes

The old C64, although extremely well very popular, it, it must be admitted, getting a bit long in the tooth and does tend to show its age even when compared with some other contemporary makes, and more than ever by modern day expectations. For instance, the way in which the operating system with which it is provided leans in favour of tape based data storage, to such a degree that when floppy disk drives became more affordable, the unusual manner in which the 64 was made to converse with them was guaranteed to frustrate in double quick time. The one consequence of this though is that such drives have to take care of the large part of disk management themselves, which leaves the computer free of these worries.

There is the, to put it politely, crude simplicity of the Basic provided, when you consider what wonderful and useful keywords other machines have. It didn't take me too long to discover that really it's a good thing that the 64's Basic should be so, or less. Whilst it is still possible to do what most other Basic do, with a lot of applications, my feelings are easily transportable to another machine, since my standard Microsoft based keywords are used. Have you ever tried converting for example a BBC program for a Commodore to use? Forget it!

In order to exceed the Commodore's expertise, or speed things up a bit, one usually has to resort to machine code. This isn't necessarily all that difficult (it depends on what you want, not all that can be done in machine code is worth doing, and not all that is worth doing can be done), because there are a whole host of valuable and easily used routines in both the Basic and KERNAL ROMs available to help perform the necessary functions. You may have already seen and used by *LINE INPUT* routine (in a previous issue) which uses this concept to effectively give the C64 what amounts to a new Basic keyword.

Of course there are now a number of after-market products which can give you what you need especially in the area of disk management, some of which are cartridges or alternative ROMs and some of which are software packages. But, if you want to keep your C64 as standard as possible (or whatever it is you want to do, you need something that leaves the necessary virtually untouched), is there a way you need it, and remains unobtrusive and out of the way of all other tasks?

This is *DISKMAN* (Disk Operating System Manager), originally written to provide the C64 with the ability to reorganise that disk drive area, but not after it is such that I cannot use my little machine code or modified Basic routines. In essence it is similar to something once provided on a different disk supplied with a new 1341 disk drive (as they still), and is primarily meant to be an aid for the Basic programmer.

Isn't the C64 a wonderful machine? Writing *DISKMAN* was so much easier than expected that I spent the same time and effort adding some extra utilities that I was sure would prove very useful while editing Basic text and developing a program. Okay, so I've been speak having got used to using an IBM PC, but I didn't see why my Commodore couldn't do the same sort of things. Consequently, *DISKMAN* is now accompanied by a group of useful utilities which don't actually have anything to do with disk management, but which make editing Basic a whole lot easier and quicker. These include a convenient Non-Maskable Interrupt (NMI), programmer's hex/octal keys for implementing the most of the repeated Basic commands used during editing (e.g. *PRINT*), and an *END* routine. For convenience many of these have similar syntax to the old DOS 5.1 on the 1341 status disk, and *The Final Cartridge*.

Installing Dosman

Type in and save the program **DOSLOAD**. Once run, this will create the MFC program - **DOSMAN**. To activate **DOSMAN**, type **SYSTEM** after loading.

The program and its satellites sit at 31381 (SCANS) onwards, leaving the lower free RAM area free for you or your programs to use.

Commands Available

SYS 9224 This enables/re-enables **DOSMAN**, the custom NMI and the function keys.

Q Y This disables **DOSMAN**, but leaves the custom NMI and the function keys active.

[RUN,STOP,RESTORE] - This disables the custom NMI and the function keys but leaves **DOSMAN** intact. A BRK instruction executed in machine code has the same effect.

Having got it in and installed, you have access to the following:

The six primary DOS commands

Direct mode only, ignored in program mode

@ (on its own) - get and print disk drive error message

@ - command -- Send command to current disk drive if it isn't one of the three secondary commands below. You do not enclose it in quotes. The command is any of the conventional DOS commands such as **DIR** to retrieve, **Q Y** to validate, **CNAME**=**NAME** to copy file, etc

The three secondary DOS commands

@ - number -- Change the current device to **number** for all further operations. e.g., **@ 9** results in all further DOS services to be carried out with device **9**. **@ 8** changes the current device back to **8**.

@ Y - optional mask - Get and display disk directory from the current device. Basic memory addresses unbracketed. Wildcards and filetype identifiers can be used in **< optional mask >** to select files to view locally or according to device, e.g. **@SDISK* *** lists only files beginning with the first three characters **DOS**, **@SYTH*** lists only filenames of five characters in length, **@P*P** only lists files of type **PRG**.

FX Disables **DOSMAN**. DOS commands will no longer be recognised, but will produce **SYSTEM ERROR**.

/ - LOAD

/ filename - Load **filename** from current device into basic memory, replaces program already existing if any. If there was a problem during the load then will be **LOAD ERROR** displayed. You must then use **@** to interrogate the drive to find out what went wrong, which will return e.g. **FILE NOT FOUND** or **DRIVE NOT READY**. If the load was successful there will be no message after **LOADING** and before **READY**.

```

** 100 SYS 9224
** 110 SYS 9224
** 120 SYS 9224
** 130 SYS 9224
** 140 SYS 9224
** 150 SYS 9224
** 160 SYS 9224
** 170 SYS 9224
** 180 SYS 9224
** 190 SYS 9224
** 200 SYS 9224
** 210 SYS 9224
** 220 SYS 9224
** 230 SYS 9224
** 240 SYS 9224
** 250 SYS 9224
** 260 SYS 9224
** 270 SYS 9224
** 280 SYS 9224
** 290 SYS 9224
** 300 SYS 9224
** 310 SYS 9224
** 320 SYS 9224
** 330 SYS 9224
** 340 SYS 9224
** 350 SYS 9224
** 360 SYS 9224
** 370 SYS 9224
** 380 SYS 9224
** 390 SYS 9224
** 400 SYS 9224
** 410 SYS 9224
** 420 SYS 9224
** 430 SYS 9224
** 440 SYS 9224
** 450 SYS 9224
** 460 SYS 9224
** 470 SYS 9224
** 480 SYS 9224
** 490 SYS 9224
** 500 SYS 9224
** 510 SYS 9224
** 520 SYS 9224
** 530 SYS 9224
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** 670 SYS 9224
** 680 SYS 9224
** 690 SYS 9224
** 700 SYS 9224
** 710 SYS 9224
** 720 SYS 9224
** 730 SYS 9224
** 740 SYS 9224
** 750 SYS 9224
** 760 SYS 9224
** 770 SYS 9224
** 780 SYS 9224
** 790 SYS 9224
** 800 SYS 9224
** 810 SYS 9224
** 820 SYS 9224
** 830 SYS 9224
** 840 SYS 9224
** 850 SYS 9224
** 860 SYS 9224
** 870 SYS 9224
** 880 SYS 9224
** 890 SYS 9224
** 900 SYS 9224
** 910 SYS 9224
** 920 SYS 9224
** 930 SYS 9224
** 940 SYS 9224
** 950 SYS 9224
** 960 SYS 9224
** 970 SYS 9224
** 980 SYS 9224
** 990 SYS 9224

```

```

00 980 DEFEND1 251 25 255 255 0
01 251 255 25 255 255 25 255 255 255 255 255 255 255 255 255
02 255 255 255 255 255 255 255 255 255 255 255 255 255 255
03 985 DEFEND2 2 255 255 255 255 255
04 2 255 255 255 255 255 255 255 255 255 255 255 255 255 255
05 170 DEFEND3 255 25 255 255 255
06 25 25 255 255 25 255 255 255 255 255 255 255 255 255
07 990 DEFEND4 251 255 255 255 255 255
08 251 255 255 255 255 255 255 255 255 255 255 255 255 255
09 255 255 255 255 255 255 255 255 255 255 255 255 255 255
10 995 DEFEND5 255 255 255 255 255 255 255 255 255 255 255 255 255 255
11 255 255 255 255 255 255 255 255 255 255 255 255 255 255
12 1000 DEFEND6 251 255 255 255 255 255
13 251 255 255 255 255 255 255 255 255 255 255 255 255 255
14 255 255 255 255 255 255 255 255 255 255 255 255 255 255
15 1005 DEFEND7 255 255 255 255 255 255 255 255 255 255 255 255 255 255
16 255 255 255 255 255 255 255 255 255 255 255 255 255 255
17 1010 DEFEND8 251 255 255 255 255 255
18 251 255 255 255 255 255 255 255 255 255 255 255 255 255
19 255 255 255 255 255 255 255 255 255 255 255 255 255 255
20 1015 DEFEND9 255 255 255 255 255 255 255 255 255 255 255 255 255 255
21 255 255 255 255 255 255 255 255 255 255 255 255 255 255
22 1020 DEFEND10 251 255 255 255 255 255
23 251 255 255 255 255 255 255 255 255 255 255 255 255 255
24 255 255 255 255 255 255 255 255 255 255 255 255 255 255
25 1025 DEFEND11 255 255 255 255 255 255 255 255 255 255 255 255 255 255
26 255 255 255 255 255 255 255 255 255 255 255 255 255 255
27 1030 DEFEND12 251 255 255 255 255 255
28 251 255 255 255 255 255 255 255 255 255 255 255 255 255
29 255 255 255 255 255 255 255 255 255 255 255 255 255 255
30 1035 DEFEND13 255 255 255 255 255 255 255 255 255 255 255 255 255 255
31 255 255 255 255 255 255 255 255 255 255 255 255 255 255
32 1040 DEFEND14 251 255 255 255 255 255
33 251 255 255 255 255 255 255 255 255 255 255 255 255 255
34 255 255 255 255 255 255 255 255 255 255 255 255 255 255
35 1045 DEFEND15 255 255 255 255 255 255 255 255 255 255 255 255 255 255
36 255 255 255 255 255 255 255 255 255 255 255 255 255 255
37 1050 DEFEND16 251 255 255 255 255 255
38 251 255 255 255 255 255 255 255 255 255 255 255 255 255
39 255 255 255 255 255 255 255 255 255 255 255 255 255 255
40 1055 DEFEND17 255 255 255 255 255 255 255 255 255 255 255 255 255 255
41 255 255 255 255 255 255 255 255 255 255 255 255 255 255
42 1060 DEFEND18 251 255 255 255 255 255
43 251 255 255 255 255 255 255 255 255 255 255 255 255 255
44 255 255 255 255 255 255 255 255 255 255 255 255 255 255
45 1065 DEFEND19 255 255 255 255 255 255 255 255 255 255 255 255 255 255
46 255 255 255 255 255 255 255 255 255 255 255 255 255 255
47 1070 DEFEND20 251 255 255 255 255 255
48 251 255 255 255 255 255 255 255 255 255 255 255 255 255
49 255 255 255 255 255 255 255 255 255 255 255 255 255 255
50 1075 DEFEND21 255 255 255 255 255 255 255 255 255 255 255 255 255 255
51 255 255 255 255 255 255 255 255 255 255 255 255 255 255
52 1080 DEFEND22 251 255 255 255 255 255
53 251 255 255 255 255 255 255 255 255 255 255 255 255 255
54 255 255 255 255 255 255 255 255 255 255 255 255 255 255
55 1085 DEFEND23 255 255 255 255 255 255 255 255 255 255 255 255 255 255
56 255 255 255 255 255 255 255 255 255 255 255 255 255 255
57 1090 DEFEND24 251 255 255 255 255 255
58 251 255 255 255 255 255 255 255 255 255 255 255 255 255
59 255 255 255 255 255 255 255 255 255 255 255 255 255 255
60 1095 DEFEND25 255 255 255 255 255 255 255 255 255 255 255 255 255 255
61 255 255 255 255 255 255 255 255 255 255 255 255 255 255
62 1100 DEFEND26 251 255 255 255 255 255
63 251 255 255 255 255 255 255 255 255 255 255 255 255 255
64 255 255 255 255 255 255 255 255 255 255 255 255 255 255
65 1105 DEFEND27 255 255 255 255 255 255 255 255 255 255 255 255 255 255
66 255 255 255 255 255 255 255 255 255 255 255 255 255 255
67 1110 DEFEND28 251 255 255 255 255 255
68 251 255 255 255 255 255 255 255 255 255 255 255 255 255
69 255 255 255 255 255 255 255 255 255 255 255 255 255 255
70 1115 DEFEND29 255 255 255 255 255 255 255 255 255 255 255 255 255 255
71 255 255 255 255 255 255 255 255 255 255 255 255 255 255
72 1120 DEFEND30 251 255 255 255 255 255
73 251 255 255 255 255 255 255 255 255 255 255 255 255 255
74 255 255 255 255 255 255 255 255 255 255 255 255 255 255
75 1125 DEFEND31 255 255 255 255 255 255 255 255 255 255 255 255 255 255
76 255 255 255 255 255 255 255 255 255 255 255 255 255 255
77 1130 DEFEND32 251 255 255 255 255 255
78 251 255 255 255 255 255 255 255 255 255 255 255 255 255
79 255 255 255 255 255 255 255 255 255 255 255 255 255 255
80 1135 DEFEND33 255 255 255 255 255 255 255 255 255 255 255 255 255 255
81 255 255 255 255 255 255 255 255 255 255 255 255 255 255
82 1140 DEFEND34 251 255 255 255 255 255
83 251 255 255 255 255 255 255 255 255 255 255 255 255 255
84 255 255 255 255 255 255 255 255 255 255 255 255 255 255
85 1145 DEFEND35 255 255 255 255 255 255 255 255 255 255 255 255 255 255
86 255 255 255 255 255 255 255 255 255 255 255 255 255 255
87 1150 DEFEND36 251 255 255 255 255 255
88 251 255 255 255 255 255 255 255 255 255 255 255 255 255
89 255 255 255 255 255 255 255 255 255 255 255 255 255 255
90 1155 DEFEND37 255 255 255 255 255 255 255 255 255 255 255 255 255 255
91 255 255 255 255 255 255 255 255 255 255 255 255 255 255
92 1160 DEFEND38 251 255 255 255 255 255
93 251 255 255 255 255 255 255 255 255 255 255 255 255 255
94 255 255 255 255 255 255 255 255 255 255 255 255 255 255
95 1165 DEFEND39 255 255 255 255 255 255 255 255 255 255 255 255 255 255
96 255 255 255 255 255 255 255 255 255 255 255 255 255 255
97 1170 DEFEND40 251 255 255 255 255 255
98 251 255 255 255 255 255 255 255 255 255 255 255 255 255
99 255 255 255 255 255 255 255 255 255 255 255 255 255 255

```

LOAD & RUN
 < filename > Load filename from current drive into Basic memory and RUN it immediately afterwards. If a **LOAD ERROR** occurs it will not be RUN. See above if in error.

% = VERIFY
 % < filename > Verify that program currently in Basic memory is the same as < filename > on disk in current drive. If the verify is successful (they are the same) no message appears between VERIFYING and READY. If they are not the same you will get **VERIFY ERROR**.

! = APPEND
 ! < filename > Save the KERNAL load routine is capable of **LOADING** in anywhere in memory. There's no reason why we can't include this very powerful utility. Armed with the ! command it is now easier to create a library of Basic program modules or to write a program in pieces, each tested and debugged individually as this goes time and is more convenient, and is less confusing. It also encourages structured programming, writing each piece of a program as a sub-routine. The important thing to remember about APPENDING though is that you must ensure that the next block of Basic text appended has higher line number than that already in memory. It won't prevent it being loaded but the interpreter can't access the lines above the point where lower numbers are found. If a **LOAD ERROR** occurs, then you've got a slight problem - the append process starts by determining the Basic variable pointer **FARLAB** by two, to bring it in line with the true end of the program in memory and to use it as a starting address. If the load failed and APPEND is re-attempted, **FARLAB** is further incremented by two. If at the second attempt the load was successful the the new data will crash over the end of the already existing program. To prevent this re-define **FARLAB** with the OLD routine, before re-attempting APPEND.

= SAVE
 = < filename > Save program in memory as filename to current drive. The DOS error message follows automatically. If the save failed it could well be **FILE EXISTS** for example. Now **FARLAB** is used to indicate where the text is. If its value has altered for any reason (usually a suspiciously common occurrence) and not just through using one standard methods like programmed APPEND then either not all of the program will be saved (**FARLAB** has short) or some of the variable storage area will be saved with it. Every loaded a program, RUN it and have it crash? Or LISTING it's found to have failed with gibberish? This is the kabuki of it. The OLD routine will make it for the low through.

Warning

All of the **LOAD**, **LOAD & RUN**, **VERIFY** and **APPEND** functions have the effect of reinitializing **FARLAB**. This is done correctly unless an error occurs. If for example a verify fails, **FARLAB** will end up reflecting the point where the end of the program verified on disk would have been if it had been loaded, and not where the program in memory is now. If a **LOAD** failed then it will have a stupid value like an address on some page memory (bank). But good old OLD will come to the rescue. Also all **LOAD**, **VERIFY** and **APPEND** processes include **BASIC** lines and perform an automatic CLR on completion.

The Function Keys

program. It would be nice if it were possible to simply force the machine to direct mode. Here and there the screen shows us that we can still read our printed variables, etc.

Did you know that the [RESTORE] key alone is the thing that guarantees the NMI Normally nothing apparently happens, because the KERNAL routine handling the NMI first examines the keyboard to see if the [STOP] key is down. If it is, then the warm start is performed. If it's not, then no changes are made and the C64 carries on as though nothing had happened.

The first part of the custom NMI routine is a duplicate of that of the KERNAL NMI Handler, with the difference that if the [STOP] key check is false then our custom interrupt is performed. If the [STOP] key is down then the routine is carried out by the KERNAL exactly as standard.

If the [STOP] key is not down then we get instead:

INTERRUPTED

READY

INTERRUPTED is printed in yellow, READY, and all further text typed, is white. The screen remains intact and no drastic memory changes are made, other than that the custom NMI vector is redefined (this isn't actually necessary, but the routine is then used to install itself).

Try the

POKE #164,54:POKE #666,34:POKE #170,92.

Now 535 49048

What's happening now is that the C64 is trapped in an endless machine code loop. Tap [RESTORE] to bring it back. Note your POKEs are still on screen.

The OLD Routine

Of all the keywords the C64 hasn't got, the one it could really do with is OLD. OLD is the opposite of NEW, but as I said beforehand, it's not just a means of recovering a listing that has been NEWed by mistake. Whether NEWed or not, it effectively reboots a Basic program in memory by re-checking it and redefining its pointers. It doesn't seem likely that there should be interrupts but it can happen in the process of constant text re-writing and re-adding, and particularly where lines are added or deleted without typing CLR first. In these circumstances it is possible for poor old PARTIAL to get a bit confused, resulting in the interpreter trying to make sense out of something which is actually a variable, or a large chunk of rubbish appearing between the end of the program (actually terminated properly as a RUN OK) and the variables, and which is SAYed with the program! It's happened to me several times.

If NEWed the listing hasn't actually disappeared. All that's happened is the first two bytes of its storage have been altered, and two zero bytes in a position where a pointer to next BASIC line should be means end of program. The "OLD" routine inserts a dummy value in there, which doesn't matter as the BASIC machine routine is then called to sort it out.

It goes better. Try the (load a program with / Edit menu) and press the reset button if you have one, or else type 575 44738 (assuming that the machine will react in standard form). Either of these actions results in a "cold start", what you get when you smash on the C64. I bet you think everything has been wiped out, doesn't you? Not so. It's true that one of the functions of the "cold start" is to perform a memory test, but this is of a non-destructive nature and in any case is only used to test out where the Basic ROM is so that the top of Basic memory can be defined. In actual fact the only way to erase the machine, completely is to switch the machine off!

Now type 575 51997

Look, you didn't get a "warm start" (like [RUN/STOP/RESTORE]) so the OLD routine is still there. Now LIST. Hey presto, the Basic program is still there too? Now you can get out of major problems with the reset button and not lose everything.

So that's DOSMAN et al. It's highly probable that you may quickly feel helpless without it. I know I am.

DOSMAN Memory Map

\$C640	51751	DDPFUNC
\$C644	51984	PUTKEY
\$C64A	51910	FLPUT2
\$C64F	51910	TRACON
\$C64E	51904	TRACOF
\$C6B1	51969	QNM5G
\$C6BC	51980	OPFM5G
\$C648	52040	OUTM5G
\$C65A	52038	TENTRY
\$C6C0	52080	NMICUS
\$C6E3	52197	Q6D
\$C6C9	52224	DOSMAN
→ C03	52227	VECTAB
\$C613	5224	COMTAB

C64 PROGRAM

Entry for custom IRQ. Test if function key down, and process as necessary. If not service IRQ as normal.

Copy string pointed to by x, y into keyboard buffer and clearing it.

^SYSINH\$RETURN\$^V,

^SYSINH\$RETURN\$^V

SYS here for [TRACE ON]

SYS here for [TRACE OFF]

^TRACE ON\$^V

^TRACE OFF\$^V

Print string pointed to by x, y till closing ^.

Display BASIC line No. while

^TRACE ON\$^V

Install/reinstall/performs custom NMI

SCBC3 32163 **INQCUS**

Install/reload custom IRQ for function keys.

SYS here for "OLD" routine

SYS here for install DOSMAN, custom NMI and function keys

Primary DOS command jump table

List of primary DOS commands

SCC18	32251	BUFFER	DOSMAN's input buffer.
SCC73	32359	FLAG	Made flag for LOAD/LOAD & RUN/VERIFY APPEND
SCC77	32363	DEVICE	Copy of current device number
SCC79	32365	Temporary storage of disk directory sector count	
SCC7B	32367	BASTAB	"LIST\$RETURN\$^O," "RUN\$RETURN\$^O," "GOTO\$^B," "CONT\$RETURN\$^O," "SYS2281\$RETURN\$^O"
SCCA8	32392	GETVAL	Get numeric value from BASIC line into \$14-\$15 hex.
SCCB0	32400	FLIST	Table of BASTAB address positions
SCCCB	32427	NMIWRD	"INTERRUPTED\$^O"
SCCDE	32446	CODE	Storage of code to wedge CHRGET
SCCE1	32449	INSTAL	Wedge CHRGET and install DOSMAN
SCCF3	32467	ENTR	CHRGET jumps here to test for DOS command.
SCD03	32533	COMM	Process recognized primary DOS command
SCD8D	32641	GETERR	Get and display current device error message
SCD8E	32644	SENDCOM	Send command string to buffer to current device
SCD8F	32646	READ	Input BASIC line into buffer
SCDA5	32645	GETCHR	Just like CHRGET but doesn't ignore colons
SCDRA	32666	CHADEU	Change current device number as memory.
SCDEA	32682	RESTOR	Restore CHRGET to normal, disable DOSMAN
SCD0C	32700	GETDIR	Get and display disk directory from current device
SCD61	32833	LOADL	Load BASIC prog.
SCD63	32841	LOADR	Load and run BASIC prog.
SCD67	32849	LOADU	Verify BASIC prog.
SCD6D	32856	LOAD/ LOAD & RUN/ VERIFY/ APPEND error handling	
SCDCA	32904	APPEND	Append BASIC prog. to memory
SCDCC		SAVE	Save BASIC prog. in memory to current device

RESET CIRCUIT

Make your own reset
circuit easily and
cheaply

By B. Leerkotte

One of the most interesting design faults of the C64 is that Commodore omitted a reset button. If you do not own a variable cartridge, you are constantly at the mercy of power surges and power losses. How many times have you found that all important program (the one that you have not bothered saving yet)? If you are one of those unfortunate ones, then this article is for you. I will show you how, with a little effort, you can build your own.

The reset is achieved by pressing the restore key for approximately 2 seconds. The circuit must be installed in the RE-Insert which normally triggers the reset timer U20. The circuit replaces the resistor R30 (links).

The theory

The moment that the Restore key is pressed, capacitor CR1 is charged by way of resistor RR1. The voltage on the trigger input 2 of U20 will fall. When that voltage reaches the trigger voltage of 1.5V, the timer U20 gives a reset pulse.

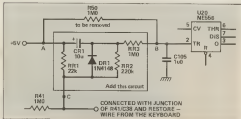
If the Restore key is released before U20 triggers, capacitor CR1 will be discharged rapidly at approximately 0.5 seconds. Therefore it is impossible to reset the C64 by repeatedly pressing the Restore key, the Run/Stop/Restore Non Maskable Interrupt will function as before.

Installation

The circuit is reliable and is easy to build on a square pad board. It is also easy to install into the C64.

Remove resistor R30 (links) and connect wire A to the left solderpoint which came free. Wire B is connected with the right solderpoint (see diagram). Point C must be connected with the right side of resistor R41. Now point C is connected the Restore key.

You should now have a functional and reliable reset source.



WHIPCRACKAWAY

**Commodore Cruaader
Kevin Crosby dons his
hat and bullwhip to
report on the latest
installment in the
Indiana Jones saga**

Left: Indy (Harrison Ford) prepares himself for action. Life as an archaeologist is not all slugging



Above: Things hot up for moments James and Jewel

"Somehow the audience always seem to be able to go 'ugghh yukky-poo' whilst still keeping a smile on their faces."



Above: "Last one in the pub is a rotten scumb!"

Phere? I've just come back from my local (pubs, not pub - the time) and what a film!

I am, of course, referring to the third and reportedly the final film in the *Raiders* series - *Indiana Jones and the Last Crusade*.

Once again Harrison Ford plays the slightly unorthodox Archaeologist cum Game Robber who stops at nothing to claim the ancient treasure he seeks. This time though we have a second Dr Jones to deal with in the form of Sean Connery, who plays Indy's Father Henry.

'*Crusade*' fits in around the previous two films *Raiders of the Lost Ark* and *Indiana Jones and the Temple of Doom*. The first part is set in 1912 when a Boy Scout sized Indy (played by River Phoenix) has one of the first adventures of his career. These scenes do an excellent job in tying together some of the mysteries in Jones' past like his absence of bullwhip as his main weapon, his fear of snakes and the curious scar on his chin, etc. Nice touch that I thought.

The action soon works as was up to 1936 when the Harrison Ford-aged Indy recovers the crucifix which was denied him 26 years previous, not for personal gain but for the good of the Institute that he teaches (how noble). However events take a turn for the worse when Indy discovers his father's notebook on the whereabouts of the Holy Grail - the fabled chalice that gives the holder a grace even better than a year's subscription to *Your Commodore* the gift of eternal life.

As this quest was his life's obsession Indy is understandably puzzled as to why his Father has sent it to him. Things soon fall into place when an American Art Collector by the name of Walter Donovan (played by English actor Julian Glover) informs Indy of his Father's disappearance and asks for his help in finding him by tracing the route mapped out in the notebook. These are, of course, some vital pieces of information missing which Indy must find out before he has a chance of finding his Father.

This initially takes Indy and his Currier Marvinus Brady (played next again by Debralee Elliott) to the town of Yonkers where they start up with Elsa, the token female in the film (played by the amazingly attractive Alison Doody) who once helped Jones the Elder on the same journey before his kidnapping. And, as is customary in an Indy film, grotesque secret involving creatures which many would not easily trade their Cam Sews for (in this case *Rats*) are used, but somehow the audience always seem to be able to go "Ughh Yucky-Poo" whilst still keeping a smile on their faces. A quality present in little other than Spielberg films.

Anyway, one thing leads quickly to another and Jones the Younger is off to the mountains of Austria to rescue dear old Dad and to help him fulfill his life long ambition - To find the Holy Grail.

Once Father and Son are reunited they very quickly become one of the silver screen's most endearing family teams. You could certainly tell that both Sean Connery and Harrison Ford were really enjoying themselves whilst making the film. I expect to see more films, not necessarily in the series, with Ford and Connery teamed up as they seemed work well together on screen.

Excellent performances too from Debralee Elliott and John Rhys Davies who both recreate their characters from the first film. Nice to see them back.

No praise for working out that good triumphs over evil but in this case at film you don't sit there wondering who will win, just how they will win.

As it is to be expected the most work and set pieces are just as good, if not better, than their predecessor's although I have to admit that the special effects were more noticeable in this particular installment especially during the scenes involving the Zeppelin and the aerial dogfights.

However, that gaps aside, a positive thumbs up for *Indiana Jones and the Last Crusade*. It has succeeded to capture much of the atmosphere of the first film whilst not forgetting the humour that was much more prevalent in the second.

Merion Speilberg and Lucas deserve several dozen Brower points plus a free subscription to *Your Commodore* (what else? - Ed) for their sterling efforts.



HOW

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AMERICAN INDOOR SOCCER

Soccer in the states is mostly played indoors by six-a-side teams. Here's your chance to play, manage and coach in the American indoor league.

Mindscape - £14.99 Disk

The American indoor league is the only way to play soccer in the US but this doesn't mean that it lacks any of the skill or excitement of the full-size game. In fact, indoor and street soccer players, both of whom you can take care of well to keep the wheels fast and furious. However, serious fans is the only real fanbase in this game. You can't take out an entire forward goalkeeper, entire midfield and general manager.

At the start of every campaign the game's general manager will come on screen and explain it to be the captain of your own team group and the twelve team player. If you're going to have any chance of reaching

the end of the season players you must think for the player. As you begin the game you have 100 ranking points to distribute, your team or trust for a better player has a skill level between 50 or 100 which would drop for better than your present average of 60 to 20.

On the field you can dribble, tackle and shoot, if you would in any other football game, except that your forwards can head the ball and shoot off with overhead kicks although the play can be broken up by entirely random penalties, falling over the best last match play.

Whenever there is a free kick or when the keeper picks the ball, the coach's

score appears which allows you to make substitutions and decide attack and defence tactics, ranging from simple to planning for the long term. All objectives are given the ability to be done.

The game shows a lot of promise but it may offend you if you're to you. First, if you've played *Comanche*, *Grid*, *Empire*, *Superstar Soccer*, you can't get much more variation. The only thing that brings the number of players on the field. This is because the game *League Soccer* has produced both soccer and a better one. *Goal* has the same game play.

GoalTime, the game developer, also wrote *Indoor Soccer* and *Clubhouse Soccer*.

INFO

Gameplay: 50%
Graphics: 46%
Sound: 35%
Lastibility: 40%
Overall:
43%

Tony Holmwood

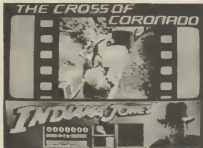


INDIANA JONES THE LAST

The man in the hat is back again and this time he's brought his dad! That's how they trailed the latest adventure of Indiana Jones. Now it's a computer game.

Lucasfilm (US Gold) - £24.99

Below: The cross at Coronado? Is that the same as the Maltese Cross?



YOU'VE seen the film, now play the game that's the message from Lucasfilm as it launches a platform-style arcade game for the Amiga, with other versions to follow

shortly. This is, in fact, just one of two games that will be based on the film, the other being an arcade adventure produced by Lucasfilm.

The arcade game is based on the sequences from the

film and plots Indy's progress from a coast through to his final crusade for the Holy Grail. As the game opens he has just entered the maze complex in which thieves are stealing the silver

INFO

Gameplay: 65%
Graphics: 60%
Sound: 45%
Usability: 55%
Overall

56%



cross at Coronado. With their backs to turned Indy grabs the cross and runs. On screen the caves are full of platforms, ropes to climb and hot lava, armed with guns if you're going to survive you'll need tactics so you can see where you're going and whips to battle your way through to the exit. Then the classic entrance on top of a stone tower packed with really wild animals. This is where Indy learns to use a whip for the first time.

It is now 1936 and Indiana Jones is among the Nazis to find the Holy Grail. His only clue is his father's Grail diary that leads them both underground into the sea-salt crypt of a Venetian church where they hope to find the grave of a Good Knight. After slaying a castle to rescue his dad, and escaping in a Zeppelin, Indy arrives at the final and best part of the game as he is here

ONES AND CRUSADE



the Great Temple. Here he must pass three challenges called the Breath of God, the Word of God, and finally the Path of God. These challenges become puzzles that must be solved with your joystick if you are to reach the Goal.

Lunarfilm hasn't taken any chances by using the tried and tested platform style of game but with the whip cracking action it seems to suit the style of the film. Add a reasonable recreation of the Indiana Jones theme and you've got a game that's a lot of fun to play.

Tony Hetherington

Lunarfilm is the software production part of the company owned by George Lucas, who is one of the movie moguls behind the film.



Above: Everybody's got skeletons in the closet

Below: What an effort before lady really is



Below: Underneath the arches!



Cartoon Capers
and animation antics
abound with this latest
release from Magic Bytes



ANYONE who has read more than a few of my reviews will know that I have little time for licensed games. All too often, money that could usefully have been used in developing the product is spent on acquiring the rights to a film, television series or whatever. Add the amounts that we are talking about and not possible.

The latest licensed title to come my way is Tom and Jerry from the German Company Magic Bytes and I am afraid that it does little to improve my above mentioned view. Just the opposite in fact.

The idea behind the game follows that of the cartoons reasonably well. Mouse goes looking for food. Cat sees mouse. Cat chases mouse. Cat catches mouse. Mouse escapes. Cat gets his comeuppance.

Well, Jerry is out looking for lumps of fat. However he chases, scattered around five different rooms. He has to collect as much as possible in the allotted time, bouncing off items of furniture in the manner of the platform days of old. The rooms are connected via a series of

tunnels where you can gain or lose extra time by picking up either cheese or explosives.

Jump on the white head of Jerry to stop Jerry by grabbing him whenever he can causing Jerry to lose 30 seconds of his time also where Jerry can drop things on Tom's head to keep him quiet for a while or can distract him by, for example, turning on the television.

Jerry's frequent choice is full of holes. Unfortunately the gameplay suffers from a similar problem. To start with there is no scoring system in the game. Apart from there being no incentive to play, you have no idea

as to how well or badly you are doing. This is tantamount to other elements of the gameplay. For example, it now becomes pointless to try to stop Tom. The time spent in setting up an 'explosion' could better be spent trying to pick up more cheese.

The tunnel sequence does not work at all well at all. The dynamic explodes as soon as you look at it, let alone touch it. Trying to jump past the furniture is a lottery. Identical pieces may make you think over them or allow you to walk underneath them. When Tom catches you, you get transported randomly on the screen that you are on. It is

quite possible that you will be put in a dead end and have to wait for Tom to come and kill you again - a wonderful bit of game design I don't think.

The manual has been translated from the German by someone who can't speak English. It is littered with spelling mistakes (in the game) and two of the pages are printed out of order.

I can't write any more mainly because I don't know that many bad words. All I can say is - don't waste your money!

Magic Bytes -
£9.99 Tape,
£14.99 Disk

INFO

Gameplay: 15%
Graphics: 55%
Sound: 40%
Lastability: 30%
Overall

33%



Alas! Not Jerry you can't drive - you're only a mouse!



Above: You shall have a Pyg.



Above: No, It's Not Koolhaas' Simulator!

THE summer season had come to Arcty island and thousands docked to its beaches unaware of the terror that swims just below the calm seas. A great white shark was now feeding in these waters and it was feeding on people.

At first they thought the water's weeds were caused by boating accidents but now you, bloody Chief of Police, the job of ridding the island of this menace. Together with Quant, a shark fisherman, Kwooper, a shark expert, and three expert divers you set out to kill you. Unfortunately, the special gun and its bullets that will kill the maniac shark were on a boat that struck the reef and sank, so your first task is to dive down into the dangerous waters and find them. To add to your troubles Mayor Vaughn has refused to close the beaches and hopes to cover it up until you kill the shark, but you

must hurry, if seven swimmers are chopped you'll be locked and the game will be lost.

One by one, your six divers climb into the diving bell and dive down into the depths of the reef to search for the four parts of the gun and the four super bullets that will kill Jaws. This isn't easy as the waters are teeming with exotic plants and fish out to eat you, if you think they're trouble just wait until you see Jaws. Luckily you'll also find useful objects to help you, such as extra air to top up your dwindling supplies, mines and bombs to clear areas, bullets for your gun and treasure to add to your score and collection.

Eventually you'll gather all the gun bits and make you good, but your challenge is far from over as you have some three bits of the great white shark or start all over again.

The game is quite fun to play but there's one thing I can't understand, why has Screen 7 gone to trouble of getting the rights to a film and then produce a game that has little to do with it? Tony Hetherington

At last, the cult film of the seventies that terrorised countless cinema audiences has now appeared on the computer screen.

Screen 7 - £9.99

Jaws is the debut game for our new software house Screen 7.



INFO

Gameplay: 65%

Graphics: 43%

Sound: 39%

Lastability: 64%

Overall:

53%

LIFE AND DEATH

Has the NHS fallen so low that they'd let a complete lunatic like Duncan Evans into the wards? Oh no, they have.

Mindscape - £29.95 Disc

There's no need to be afraid dear, this won't hurt at all... Aaaaarrghhhhh! Gosh, did I forget to turn the gas on. My mistake, still, she was getting on, and we did need the beds.

Every fix you ever had about going into hospital is going to be realised when you play *Life and Death* by Software Toolworks. Trustfully in this game you are that mad-eyed surgeon, and it's the other patients who are them to suffer. And suffer they do, as you blunder through medical training, through the wash cycle and the morgue packed.

Life and Death is all about surgery, progressing from being a naive scalpel apprentice, to mastering the appendectomy before ascending that greatest of organs, the heart. Still, it'll take you some time, and loads of patients, before you get that far.

It all starts with you signing on at reception, under the watchful eye of Monica, before heading to the staff room to pick up your responsibilities for the

rest of doors, into the operating theatre. There are six persons on hand in total, each represented by a file and digital gas, of which you must pick two.

Then you're off to the classroom for an introductory speech, and a few hints and tips on general surgical practice.

After answering a phone

call, which double as the copy protection scheme, you get your first patient. Time to don the rubber gloves and face mask that come with the game! First examine the poor thing by prodding them in every section of their chest and abdomen. If there's any pain then a sampled squeal transfers to a

Have a look at their

record chart and look up the symptoms, and decide whether to operate, administer antibiotics, order them



EATH

in another doctor, go to X-ray, observe or use the ultra-sonic. For the first half of a dozen patients you'll probably make the wrong choice and end up back in the classroom being told so. At

least you'll know better next time since your victims never get a second opportunity.

Eventually you'll get a case whose job here to operate, and that's where the real fun starts as it involves injecting drugs to counter blood pressure loss and heart wobbles, setting up glucose and blood traps, and

using all manner of Swedish appliances to peel back layers of flesh as you head for the appendix.

The trouble is in finding the damn thing, and avoiding cutting into the Coxa, which is nasty. If you have a mouse connected to your PC it makes far easier surgery, as you often have to react very quickly.

There is a kind of perverse fascination in this game, the slax and claw eyes,

where the doctor of a patient is simply erasing, and the phasms creep from scoring how far in you can get before cooking it all up.

The CGA has colour graphics are excellent, and are wonderfully complemented by the sampled screams, and the best news is that the Amiga version should be ready about now.



Profile of Dr. Tom Shepherd:

Technical: Dr. Shepherd's area of expertise is cardiology. During an operation, he will keep an eye on the patient's ECG. When the ECG becomes abnormal, he will inform the surgeon and recommend a course of action.

Personal: Dr. Shepherd gets along with most of the other staff members. He works particularly well with Lester's brother.

Dr. Tom Shepherd
 Lytle Cardiology
 Specialty Cardiology

INFO

Gameplay: 87%
 Graphics: 85%
 Sonics: 73%
 Lastibility: 88%

Overall:
 86%*

Software Footprints is based on a list of Commodore 2000 and 2180 programs and is processing a three category report to Life & Death.

Left: Slice, main and chop. All in the name of medicine, of course. Here, where did I place that kidney?

SET in Paris the game puts you in charge of a six-man assault team containing three commandos and three machine-guns. Your targets are terrorists that have seized an Embassy and it's your job to rescue any hostages.

In a two-stage game you must set up your machine-guns before heading to the commandos. However, the ter-

rorists have the surrounding streets covered with searchlights so your machine-guns must run, crawl and dive in and out of any shadows that come to the window. However, you must be sure that they're terrorists and not hostages before you open fire. Once the assault area is cleared you proceed to the next stage.

The commandos enter the building by sneaking from the roof and reaching through the windows. They must then clear the rooms of terrorists. Inside, the screen changes to show a 3D view of the rooms as corridors you're currently in and a map that plots the terrorist's movement. Now you have to think quickly to gun down terrorists while avoiding any injury to the hostages. When you find a hostage you must escort him to a safe room on the third floor and protect them from terrorist attack by moving in front of your team. As in a real assault game tactics and the speed and skill of your team will decide the outcome. Perhaps the toughest challenge is when a terrorist is hiding behind his hostages. Then you have to make your shots count and that will take some practice.

Several levels of difficulty and the ability to play either half of the game separately will ensure you'll have something back for more. *Tom Mathewson*

INFO

Gameplay: 88%
 Graphics: 72%
 Sound: 32%
 Usability: 75%
 Overall:
67%

Ever since the SAS stormed the Iranian Embassy in 1980 we have waited for a game that captured the atmosphere of such a raid. Here it is.



Above: Blast him, burn him, murder him. Ready or not, that's a hostage! Ah, what fun anyway...

Below: We'll have an algorithmic adventure in this mag.



Hostages is the latest game from Infogrames, the company that brought you the great and wonderful *Capitaine Mouton*.

**Infogames £9.95
 Tape, £14.95 Disk.**

Pinball games are few and far between, so any new ones will be welcomed by digital pinball wizards. Unfortunately, this one is way off target.

TIME

SCANNER

By Electric Dreams -
£9.95 tape

TIMESCANNER is the long-awaited conversion of the successful coin-op based on pinball. In the game you have sensibly fallen into a time warp and the only way out is to complete four pinball tables. To add to your problems you have to complete three of them before you get a chance to play the fourth.

Each table has a theme and an objective. For example, on the Volcano table you must light up the letters in the word Volcano by hitting a transparent character, finally the volcano erupts. Unfortunately, this makes the other targets, bumpers and rollovers quite redundant. The same is also true of the Runes and Squares (Higgsons) tables.

Another problem is that the tables are in two halves of a scrolling screen and it's almost impossible to get the ball from the bottom half back to the top. This can be important since the targets you must hit in the Squares table are all in the top half of the table, so are the two chutes that transport you to the other table.

Unfortunately though get worse as the game's graphics and speed are more in line with a 16K Spectrum game than a 64K C64 and the response must be that all it's bit versions have been dev-



igned with the Spectrum so mind.

The reward for finally, slowly and painfully completing a level is the release of two other balls so you can play with three at once

(which slows the game down, if that's possible) so that it takes several seconds for a ball to hit the top of the screen and bounce back to the flippers.

Tony Hetherington



Electric Dreams has enjoyed considerable success recently with a string of hits. This isn't one of them.

Editor: Do you think that this screen is, perhaps, the Volcano Screen?



US Gold - £9.99

As part of the Dungeons and Dragons deal, US Gold has created a game to bring role playing to the masses.

HEROES OF THE LANCE

CREATE a computer game based on Dungeons and Dragons that will appeal to arcade players. That was the challenge put to US Gold as its part of the three console deal with TSR and D&D authors TSR. This is the result and it's a game that's played entirely with a joystick.

Unlike the other D&D games that are based on the Forgotten Realms, Heroes of the Lance is based on the Dragonlance series of books and game modules that came about because players of the role playing game demanded more dragons in Dungeons and Dragons. This game features an ancient black dragon called Khazid'ra who guards the platinum deities of Melnick. These deities are your only hope of restoring back to the old Gods and foiling the evil Queen of Darkness' plan to rule the world.

The Deity lies deep in the caves of the Temple of Ash Tenech which is now infested with Ology Dwarfs, giant spiders, undead and Duzco (a human dragon half breed created by the evil Queen). You control eight brave adventurers although only one appears on the screen at a time. Your party has the usual mix of fighters and spell casters which, in this game are given their spell powers through two staffs. Kaxtha is the magic user and holds the staff of Maglan which has 100 charges and can cast spells such as sleep, magic missile and charm (tapping one finger) and web (for two). Gekhsoun carries the clerical blue robe staff that



Left: I wonder if the staff of Maglan is as handy as the staff of Argon.



Below: Your Contender's roll of recovering costumes.

has 100 charges and can cast spells ranging from the obvious cure light wounds (1) to Raise Dead (5) and the useful detect dragon breath (3).

The action takes place in a midway scrolling arena with a compass that lights up when you reach a junction. This is a bit a little confusing, but once the game is in full hand you haven't time to draw accurate maps. Com-

bat is fast and furious with joystick movements deciding whether you cut, slash or parry, or fire an arrow (usually as a damage attack). Should you react to magic then the space bar freezes the game and presents a series of menus from which you can cast spells, pick up, drop and use objects and continue and select lanes.

Tony Robinson

INFO

Gameplay: 67%
 Graphics: 55%
 Sound: 47%
 Usability: 48%
 Overall:
 53%

TREBLE CHAMPIONS

Challenge Software's Best Team

And so the footy season starts again. To coincide with this momentous occasion, Challenge Software deals us a dose of soccer management to test even Kenny Dalglish himself.

Challenge Software's first take at soccer was way in Treble Challenge, a football management game that seeks to expand the foundations laid by Football Manager and more recently, Football Director II. The latter was a hard act to follow, and the only way to do so would be to better it. So the new player, *Treble Champions*, is the result. It's worth a few features to increase the realism aspect of games of this ilk.

The goal (no pun intended) in *Treble Champions* is a new, flexible one, the FA Cup and the League Cup (hopefully all in the same season) and then prove what an outstanding manager you are. This is done by manipulating players, entering the transfer market,

to improve the quality of your team, and introducing players performed by top team managers.

Players have attributes, age, fitness and potential, and obviously these are not static. Players have skills, which are ranked with the clock ticking away. A table records all stats, from goals scored to assists, and the amount to score the goals. A team file also shows which player scored and at what minute.

The most unique feature of the game is the fact that you, as manager, only have a set number of hours to perform a weekly task. Different seasons take different amounts of time, and since you have run out the more important decisions get undertaken that work will

be done. Also new to the genre is the fact you can make two substitutions during a match, and you can use computer opponents.

Finally, *Treble Champions* has an administration or bookkeeping element, for an eye for it. League Cup competition, FA Cup competition, a maximum of 20 teams and even a two-league division of 10 teams. You can play on any of these divisions, trade, and start at any of the 10 divisions. There are also some late season transfers, which you can approach with the hope of purchasing, but must be done before the transfer deadline.

Presentation does not seem particularly striking. There is a text-based presentation, but on the one hand it's better than it seems. The game is enormous and there are a plethora of options waiting to be explored.

Treble Champions is possibly the most complete football strategy game to date - which is no mean feat, I assure you. It is large, complex and, most impor-

tantly, addictive - qualities which today's soccer games need to have. Until somebody produces as large a game, but with the capability of having more than a few options, Challenge Software is sitting on the best soccer management game, and has a bright future ahead of it.

Rob Henderson

Challenge Software are the label for *Treble Champions*, a computer with a very high percentage for good quality strategy games. *Treble Champions* is its first retail release.

INFO

Gameplay: 50%
Graphics: 40%
Series: 30%
Lastibility: 40%
Overall:

40%



MILLENNIUM 2.2

Electric Dreams - £29.99

The predictions were right. The asteroid did collide with the Earth killing all life on the planet. As commander of the moonbase only you can save mankind.



Right: It takes a Millennium to play the game



Left: Look down, like while looking at my computer screen

MOOONBASE 1 is a small one with limited production and mining capabilities, a single Mark I energy unit and a population of only 100. Through careful management you must ensure the survival of the race by first stabilising the moonbase and then sitting back to witness on other worlds.

By clicking on the game icons you should soon be able to start up the colossal resource plant that mines rare materials these can be used by the production section to build new energy cells, probes to explore space, modules to support more people (100 max),

fighters to protect the base and bigger and better ships for the cosmic zero space.

Just when things seem to be going well, you receive a message from Mars claiming dominance in the galaxy and hostility against any moves you make to expand. Undeterred, you send out probes to search the solar system for a moon or planet to colonise as by now Moonbase 2 is surrounded. Soon or later the Martians will attack and if you've researched and built fighters or orbital lasers you can try and stop them but you'll probably lose some materials and people in the end.

Although Millennium

2.2 looks like a strategy game it plays like an adventure and has a series of puzzles that must be solved before you progress. These include the need for raw materials, such as copper, that can't be mined from the moon, the increasing marine life on earth and the risk of mutation and alien diseases that can spread rapidly through cargo ships to your other colonies giving you a desperate race against time to research and produce an antidote.

Although the PC version lacks the proper appeal of others it still offers the feeling of exploring the unknown and the challenge

of covering the survival of the race.

Tony Hetherington

INFO

Gameplay: 65%

Graphics: N/A

Sound: N/A

Lastibility: 70%

Overall:

69%

Ocean - £24.95

ROBOCOP

Part film character, part arcade game, all cop. It's the man in a can, and he's gunning for you. If you've been naughty that is.

Like sure you've all seen the wonderfully violent film, *Robocop*, and if you haven't then you should probably do so. Well, this game on Cyaan based on the film is certainly expert, but rather on the arcade game that followed.

After seeing the disappointing ST version (the Amiga one should be out now), I was dreadfully wrong when Ocean could do on a PC (surprisingly), the PC version is made better than the ST game, and unfortunately it replaces the arcade game.

You play Lieutenant Murphy, once flesh and blood, horribly blown to pieces by gangsters, who are secretly led by one of the mean officers in DCP Murphy was scrapped up, cloned and reprogrammed for law enforcement. Fortu-

nately, what remains of his mind throws up images of the gang, and he sets out for revenge.

Robocop is a game of many parts and levels (some small), and starts by smoking Murphy into a box of pain. Armed with a standard pistol, three lives, and an ever decreasing energy level, you must fight your way through, picking up ammo along the way. Later in the game you get to pick up other weapons, which you'll certainly need considering what you're up against.

At the end of the first patrol there are almost 1-D sections where you have to nail a criminal who is hiding behind a woman hostage. This is a pleasant break after the fire rained and a chance

to ponder over before the really offensive criminals on level two, some of whom ride motorbikes.

Level four is a photo-fit against the time race, with information as to Murphy's killer being the reward. After that it's killing all the way, taking out a drug factory, the great robot ED209, and a final encounter with the mastermind Dick Jones in the President's Office.

Robocop isn't an easy game, because poor old Murphy flashes every time a bullet hits him, and while he's doing so he can't fire back. Needless to say there are killing scenes at certain points along the way where you are caught in a murderous crossfire, and have great difficulty in getting out with one left left.

The graphics and animations are pretty good, which

makes up for the few sound effects, and with those better style weapons (there's to be break up the action, that is one patrol worth going to *Duncan Owen*)

INFO

Gameplay: 87%

Graphics: 80%

Sound: 20%

Lastibility: 81%

Overall:

84%

With other like *MAT: Le Mans*, *Op. Wolf*, *Robocop* and numerous competitors, this has been Ocean's year so far.



Above: Metallic messiah in his copper city

As the sun sets Gordon Hamlett gets funky with his remote-controlled robot.

Magic Bytes -
£9.99 Tape, £14.99 Disk.

RECENTLY quashed from graduate school as a robotics engineer you have just started your first job. You are working on the cybernetic control centre involved in planetary exploration.

As a beginner, you can expect to be let loose on the latest technology from day one. So you are given control of a second rate robot to do your dirty work. The planet is so hostile and what it seems. Real planets being a touch expensive, the company has hired an artificial one consisting of several different platforms. The idea is that you guide your robot over the surface trying to find the exit to the next level. Succeed on the first five platforms and you are given control of the latest in robot technology for the next five.

The platforms consist of a series of small rooms with different areas only accessible when you have the appropriate colour coded key. There are cameras that show if you and hidden mines all of which is bad news. At the start of the game, you have no defenses at all. You must find your later and more defences first. There are also one way couplings and transporter pads to be negotiated.

There is nothing original about *Nightdew*. Wandering round mines looking for different keys has been seen many times before and there is nothing extra in this game to make you sit up and take notice.

The graphics are poor, fuzzy, blurred and small. Indeed, the Amiga version was remarkably disappointing.

Looking more like I imagined the CGA version should look.

There is nothing particularly wrong with *Nightdew* apart from it gives no any degree of excitement whatever. Lacking appeal is limited too. Once you have learned the best path through a particular level where the traps are and so on, there is nothing to stop you completing that particular level again with great ease, every time you play.

INFO

Gameplay: 50%
Graphics: 40%
Sound: 30%
Flexibility: 40%
Overall:
40%



Above: Ouch, what a large metallic spiral!



Above: What a large metallic spiral!

NIGHTDAWN

THE STORY SO FAR

Elite - £19.99

Only a compilation, or a potted history of Elite Systems work on the Amiga? Duncan Evans gives you the real story.

Compilations are nothing new, and you might say nothing exciting. If you wanted to be really cruel you might also say they were special marketing exercises designed to tempt the 'pensive shopper' into buying what you're selling already had anyway.

Compilations can be valuable money, but looking at this one from Elite it appears that *The Story So Far* is a game, that one four games is rather strange, especially as it doesn't even take one of Elite's best games *Overlander*, or even *Live and Let Die* which the 8-bit package get.

What you do get are *Buggy Boy* (like *Warriors*, *BattleShip* and *Beyond the Ice Palace*), *Buggy Boy* was a 3-D racing game, with five tracks, and loads of obstacles rather than competing cars.

With bonus points, your game and the ability to drive on two wheels and then fly through the air - you can see that isn't exactly *Maziac*. It is a good fun though, because the tracks are graded in difficulty and even the fading reactions of the old back are good enough to complete the first three.

Like *Warriors* is one of my favourites, being the first arcade Commodore style game to feature simultaneous two player action. It isn't standing on the Amiga, it isn't a looker just like the ST version, but it is very playable and features tracks with which you run the gauntlet, as well as shooting and avoiding them.

There's a lot of earlier games on *BattleShip*, but that doesn't cover up for the fact

that this is a very standard collection of the joys and paper games. I suppose it'll save a few tons, and you can play against the computer should you be so bored.

And finally off we go into arcade adventures (and with vertical and horizontal scrolling, three types of suspension, different sound effects, decent graphics and very rough gameplay). Just getting through the first level of *Beyond the Ice Palace* is a major achievement, and when you encounter the even better graphics of level two you'll realise that the game has never been properly played.

Normally compilations can avoid a couple of the games being dull, or if you already own one or two, but with *The Story So Far* there isn't really any margin for error, and whichever way you look, you're not exactly getting the bargain of a lifetime.

Duncan Evans

INFO

Gameplay: 83%
 Graphics: 80%
 Sound: 73%
 Lastability: 84%
 Overall:

80%

Elite Systems As the leader after releasing and comparing *Overlander* to *U.S. Gold's Roadblasters* and *Acorn's* released anything more soon.



Above: *Buggy Boy*



Above: *Buggy Boy*



Above: *Beyond the Ice Palace*

VOL 1 R

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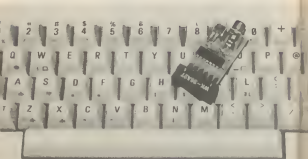
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■ REVIEW

1st CD

Can the ageing
Commodore 64 keep up
with the brash young
upstarts of the 16-bit
world. Maybe it can,
with this CD interface
from Rainbow Arts.

EDITION



There has been a lot of speculation about what CD-ROM is going to do for the computer and entertainment industry. Gigabytes of data files like an entire magazine stored on CD, with stirring musical scores to accompany the pages.

Even now we are seeing the emergence of the new technology, witness Microsoft releasing Defender of the Crown on CD for connecting up to PCs. There's the PC Engine, with its CD software, and who knows that is around the corner.

Well like you I can only guess, but I'd never have guessed what Rainbow Arts was going to do. In a seemingly bizarre marketing move, the company has released the 1st CD-Edition. This package contains an interface which plugs into the cassette port, a CD and an instruction manual.

The interface which translates the audio output of a CD player into the audio format of the cassette port is small and fragile looking. It isn't even boxed and gives the impression that a woman's confidence would result in it being stepped on flat!

The only catch with this package is the CD player. Unless the game's on the CD for that is a complication, were of such brilliance that it was worth buying an £130 or so for the CD player, or you already had one, then it isn't going to be of much use.

Setting everything up is a minor hassle, simply because of the need to have all the equipment to close properly. It says in the manual that you can use a portable CD unit just as easily, and so this is far from to set up. I give that a go.

Plug in the interface, connect a phone plug lead from the interface to the Line out on the CD player, turn on your CD4 and insert your disc and you're ready to roll. Easy enough, you then just type LOAD and sit the CD player in action. After about 45 seconds you should be into the main menu, and the CD player can be stopped or passed now. Also the portable CD unit doesn't like working with the interface as it was necessary to hold the bag out, take care, if you only have a portable, it might not work.

My main unit worked fine though, and the menu offered a choice of ten games for my deliriation. After making a selection, the menu informs you to jump to a specific track number where the game is stored, then gives you a. After anything between 30 and 50 seconds later, the decompressed program is running happily and you can turn the CD player off.

This is all good and well, but let's look at what you're getting a lot closer. For one thing the loading time isn't particularly fast. In fact it's quite slow when you realise how little data is being loaded, but is comparable with today's fat loaders on the Cdr disk drive.

How much room on the CD does all this take up? About 11 minutes worth, and that's padded out. To try and fill up the rest of the disc empty disc, the programs are recorded twice, simply add 20 to the track number to access them, and there is a selection of 16 music tracks by Chris Hillbeck (who?) to listen to through your amplifier. These music tracks are nothing special, and not worth having the CD-Edition for.

The actual games, almost an oversight in this strange project are not some state of the art games. None of them are better than my mother, but for the record that is what you get. (David's Midnight Magic (pushed) Lendforward, Mission Elevator, Impossible Mission, (Progress), L'adventurer, Solomon's Key Judo, M U L E, and Fox II.

Although Rainbow Arts has been quite brave in testing the water with this package, it has cut corners and is paying for new games and the production standards of the interface are concerned.

If you don't have a CD Player then forget it. If you already do, and you can lag it close enough to your computer then all you have to worry about is whether you really want the benefit of having ten very old games and some forgettable music on a compact disc. The isn't the technology of tomorrow, this is Rainbow Arts trying to catch up on a current fashion.

Duncan Evans



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Editor's Note

Apologies must go to Mr. M. Carroll for an error published in the August issue of Your Commodore. On page 54, we accredited Mr. Carroll's program, Disk Scrambler to S.T. Burke. Apologies all round for this error.

Software for Sale

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The Four Commodore Software Service makes available all of the programs from each issue on both cassette and disk, at a price of £5.00 for disk and £4.00 for cassette. None of the documentation for the programs is supplied with the software since it is all available on the relevant magazine. Should you not have the magazine then book orders are available from the following address:

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The Disk

Programs on the disk will also be supplied in totally working versions i.e. when possible we will not use Basic Loaders that make use of the program mechanisms. Unfortunately at the moment 4-cassette duplicate C16 and Plus/4-cassette II/plus programs for these machines will be available on the disk.

What programs are available?

At the top of each article you will find a drop containing the article type, C64 Program etc. So that you can see which programs are available on which format, you will also find a couple of symbols after the drop. The symbols have the following meaning:



This symbol means that the program is available on cassette



These programs are available on disk

Please Note

Since the programs supplied on cassette are total working versions of the program, we do not put disk-only programs on tape. There is no sense in placing a program that requires to be reading from disk on to tape.

MAY 1989

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NEXT MONTH

A NIGHTMARE ON ELM STREET

Freddy Krueger - the man with the designer looking slash
strapped to his fingers - is finally to make it to the home
computer.

NEON ZONE

The man with many colours (eyes?), John Cook, deals
us a dose of erratic action, and explores many cool-up
levels.

COMIC WATCH

A look at the wonderful world of comic books, and their
related computer games.

Plus Play By Mail Games (boards), Wren Wobbly Comics,
Learnings, and Your Programme...



THE END IS NIGH



HE IT'S THE HERRING again
 just to remind off the
 living with soft... the
 computer trade going

Landscape Gardening

APPARENTLY according to a pessimist writing in front of me there is to be a new landscape for the somewhat popular Populus (as popular as fact, that the ST and Amiga versions rose to 2nd spot in the sales chart in Computer Trade Weekly). Originally plans were to have a beed on Saturnus legend but wild and wacky Electronic Arts has a far better idea in mind.

The new landscape is now titled 'The Big Plans', with computer print-out paper as the land, computers as the settlements (from the ZX81 to a Cray) and various tools and pencils as landscape features. To be honest, I think there's a little herb tagging going on here.

Earwig 'O'

On a charitable note, the Cincinnati charity football match (which the program last abysmally last year) is to go ahead and certain occupations are taking it very seriously indeed.

The charity is question is the Hillsborough disaster appeal - a charity close to my own heart due to my support for Liverpool Football Club. Some companies are taking the game so seriously that they are in field very strong sales. One computer (who still remains nameless) have even announced that Kenny Searns (ex-Manchester City player) will be in their squad.

Let's just hope that the reason for playing is not washed over by contemporary reality.

Gang Bang

PSYGNIBER has recently announced the fact that they have lost a large contingent of copies of Blood Money as a result of a British Library board for Paris. Although the library contained a double cloak and lightning, the French gang involved only stole the Amiga version of the recent game.

If you're stopped whilst strolling through the streets of Paris, and asked by a dirty French man in a brown coat smoking Gauloises, if you would like to purchase a piece of software, don't worry, he's not trying to sell you a dodgy record.

TO SEE YA NEXT MONTH
 Bob Henderson

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